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Walter H. Smith
and his wife
Linda Smith
July 8th

1805



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View of the Gulf of Bengal.

WONDERS
OF
NATURE AND ART;
OR,
A CONCISE ACCOUNT
OF
WHATEVER IS MOST CURIOUS AND REMARKABLE
IN
THE WORLD;

Whether relating to its Animal, Vegetable, and Mineral Productions, or to the Manufactures, Buildings, and Inventions of its Inhabitants,

Compiled from Historical and Geographical Works of established Celebrity, and illustrated with the Discoveries of modern Travellers.

By the Rev. THOMAS SMITH,
Author of the UNIVERSAL ATLAS, SACRED MIRROR, &c. &c.

“ Review these numerous scenes, at once survey
Nature’s extended face, then Sceptics say,
In this wide field of wonders, can you find
No art discover’d, and no end design’d?”

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WONDERS OF NATURE AND ART.

PART IV.

A M E R I C A.

C H A P. I.

OF SOUTH AMERICA.

Situation, Climate, Soil, &c.

SOUTH AMERICA is a peninsula, surrounded on all sides by the ocean, except at the isthmus of Darien, by which it is joined to North America. It is bounded by this isthmus and the Atlantic on the north; by the Ethiopic on the east; by that boundless ocean which consists of the mingled waves of the Pacific, the Ethiopic, and the Antarctic Icy Seas, on the south; and by the Pacific ocean on the west. It extends, south and north, from between the fifty-fourth and fifty-fifth degrees of south latitude, to the twelfth of north latitude; and east and west between the thirty-fifth and eightieth degrees of west longitude from London; com-

prehending, though not the largest, by far the richest division of the American continent.

The climate of South America, though the greater part of it lies in the torrid zone, is not so intolerably hot as that of those countries which lie in the same degree of latitude in the other quarters of the globe: Some parts of Peru, which is entirely within the tropics, are disagreeably cold, owing to the air blowing from the South Sea on one side, and the snow covered tops of the Andes on the other: and the climate of Chili, which lies within the temperate zone, is one of the most delightfully moderate in the world. In other parts it varies very considerably, the air in some being sultry, and in others cool; though it is generally warmest toward the north; some places again being frequently flooded while others are perfectly dry. But in those places where it never rains, the soil, which is generally very fertile, is sufficiently watered by dews to render it productive.

From May to November (the season called winter by the natives) there is in some places a continual succession of thunder, rain, and tempests; the rains falling with such impetuosity as to give the plains the appearance of an ocean. But although in dry weather, the perpetual verdure of the woods, the luxuriance of the plains, and the rich fruits of all kinds which the country produces seem to counterbalance the winter storms; yet the tremendous earthquakes it is occasionally subject to, more than outweigh even the richest treasures of its mines which are indisputably the finest in the known world.

MOUNTAINS, SPRINGS, VOLCANOES, EARTH-
QUAKES, RIVERS, BRIDGES, &c.

It is generally allowed, that the mountains of South America are not to be paralleled in any other part of the world, for their surprising height and extent ; witness that prodigious chain of them called the Andes, which begins in the most northern part of Peru, and extends itself quite to the Straits of Magellan, a length of between three and four thousand miles. Acosta relates, that he once ascended one of the highest of these mountains in Peru, called Pariacaca ; and that he went prepared according to the best instructions he could get, with several more who had the like curiosity ; but, notwithstanding all his precaution, when he came near the top he was seized with such pains that he thought he should have fallen to the ground ; and, the rest of the company feeling similar emotions, they all hastened down as fast as they could, without waiting for one another. They were all taken with violent retchings, and not only brought up green phlegm and cholera, but a great deal of blood.

This lasted for three or four hours, till they had descended to the lower part of the mountain ; but it seems that the sickness generally goes off before they get to the bottom, and is attended with no ill consequences.

People who pass this ridge of mountains in any part of them, for upwards of five hundred leagues, are affected in like manner, but more in some places than in others. Acosta had passed the Andes at four other different places, and always felt the like disorder, but not so much as at Pariacaca ; and the best remedy they found against it

was to stop their mouths, noses, and ears as much as possible ; the air being so subtle and piercing, that it affects the entrails both of men and beasts. This indeed is no wonder, since the height of the Andes is such, that the Alps, in comparison to them, seem but as ordinary houses in regard to lofty towers. Hence our author concluded, that the air on the top of these mountains was too pure and subtle for animals to breathe in, they requiring a grosser medium * ; and this, he supposed, occasioned the above-mentioned disorder in the stomach.

As to the retchings complained of by those who pass the Andes in Peru, it is remarkable that those who travel over that high chain of them in Chili called the Cordillera, are not affected with such disorders, but only with a difficulty of breathing, which is perceived more or less on the tops of all high mountains : so that in Peru there may possibly be a concurrence of some other causes besides the thinness of the air, to produce the above

* As too gross, so too rare an air is unfit for respiration, as appears not only from experiments made by the air-pump, but from the accounts of those who have been on the tops of very lofty mountains, where the air is considerably rarefied. A clergyman who had visited the high mountains of Armenia, told Mr. Boyle, that, whilst he was on the upper part of them he was forced to fetch his breath oftener than usual ; and, taking notice of it when he came down, the people told him it was what they themselves had frequently experienced. The same ecclesiastic made the like observation on the top of a mountain in the Cevennes ; and a curious traveller, on one of the highest ridges of the Pyrenees, called Pic de Midi, found the same inconvenience, he and his company being obliged to breathe shorter and oftener than in the lower air, See Derham's Physico-Theology, p. 6, 2nd Phil. Trans. No, 63.

effects, since the mountains of Chili are considerably higher, and consequently the air at the top of them is more rarefied.

In order to give a more perfect idea of the climate on the top of these mountains, we shall give some account of that which prevailed on Pichinchia; when the mathematicians, sent thither by the kings of France and Spain, were stationed there, in order to make observations on the figure of the earth. It ought to be observed, that this mountain is almost directly under the equinoctial, and that though it is famous for its great height, it is twelve hundred and seventy-eight yards, in a perpendicular line, lower than the mountain of Cotopaxi; but it will be impossible for the reader to conceive the comparative coldness of the summit of the last-mentioned mountain, from that felt on this, since it must exceed every idea that can be formed in the human mind, though both are situated in the midst of the torrid zone.

Pichinchia was formerly a volcano, but the mouth, on one of its sides, is at present covered with sand and calcined matter, and neither fire nor smoke is seen to issue from it. Our learned author Don George Juan de Ulloa observes, that he found the cold on its top extremely intense, and the wind violent: they were also frequently involved in so thick a fog, or, in other words, a cloud, that an object at six or eight paces distance was scarcely perceptible. The air grew clear, by the clouds descending nearer to the surface of the earth, while they, on all sides, surrounded the mountain to a vast distance, representing the sea, with the rock standing like an island in the centre. When this happened, they heard the dreadful noise of the tempests, that discharged themselves on the city

of Quito, and the neighbouring country. Looking down, they saw the lightning issue from the clouds, and heard the thunder roll far beneath them. While the lower parts were involved in thunder and rain, they enjoyed a delightful serenity ; the wind was abated, the sky clear, and the enlivening rays of the sun moderated the severity of the cold. But, when the clouds rose, their thickness rendered respiration difficult, snow and hail fell continually, and the wind returned with all its violence ; so that it was impossible to overcome entirely the fear of being, together with their hut, blown down the precipice, or of being buried in it; by the daily accumulations of ice and snow. Their fears were likewise increased by the fall of enormous fragments of rocks. Though the smallest crevice, visible in their hut, was stopped, the wind was so piercing, that it penetrated through ; and, though the hut was small, crowded with inhabitants, and had several lamps constantly burning, the cold was so great, that every person was obliged to have a chafing-dish of coals, and several men were constantly employed every morning to remove the snow which fell in the night. By the severity of this cold, their feet were swelled, and grew so tender, that they could not walk without extreme pain ; their hands also were covered with chilblains, and their lips so swelled and chapped, that every motion, in speaking, made them bleed*.

* M. Bouguer, who was engaged in the same expedition as the last mentioned gentleman, says, "There is in all this range of mountains, as far as I have travelled, a constant inferior boundary, beyond which the snow never melts ; this boundary, in the midst of the torrid zone, I found to be two thousand four hundred and thirty-four

From barometrical experiments made on the mountain Cotopaxi, it appears that its summit is elevated six thousand two hundred and fifty-two yards above the surface of the sea, something above three geographical miles, which greatly exceeds the height of any other mountain in the known world. Cotopaxi became a volcano at the first arrival of the Spaniards in this country, and a new eruption happened in 1743, which had been for some days preceded by a continual rumbling in its bowels: after which an aperture was made in its summit, and likewise three others, near the middle of its declivity, at that period buried under prodigious masses of snow. The ignited substances ejected on that occasion, mixed with the vast quantity of snow and ice, melting amidst the flames, were carried down with such amazing rapidity, that, in an instant, the plain from Callao to Latacunga was inundated, the houses of the poor inhabitants were borne down, and great numbers of them perished. The river of Latacunga was the canal of this dreadful flood, till, being too small for receiving the prodigious current, it overflowed the adjacent country, carried away all the buildings within its reach, and rendered the land, near the town of the same name, like a vast lake. The inhabitants retired to a spot of higher ground behind the town, while those parts of it that stood within the limits of the current, were entirely destroyed. During

fathoms above the level of the South Sea. The snow, indeed, falls much lower, but then it is subject to be melted the very same day; whereas, above that, it preserves itself,

“ The gather'd winter of a thousand years.”

three days the volcano ejected cinders, while torrents of melted ice and snow poured down its sides. The fire lasted several days longer, and was accompanied with terrible roarings of the wind, rushing through the mouth of the volcano. At last all was quiet, and neither fire nor smoke were to be seen. But, in May 1744, the flames forced a passage through several other parts on the sides of the mountain; so that, in clear nights, the flames, being reflected by the transparent ice, formed a very grand and beautiful illumination. But, on the thirteenth of November following, it ejected such prodigious quantities of fire and ignited substances, that an inundation, equal to the former, soon ensued; and the inhabitants of the town of Latacunga, for some time, gave themselves over for lost.

We are told that there are fiery meteors about these mountains, sometimes so high in the air, as to resemble stars, and sometimes so low, as to frighten the mules, by buzzing about their ears and feet. But a phenomenon, which in this climate must appear very extraordinary, is said by M. Bouguer to happen almost every day on the tops of these mountains; though these gentlemen were the first who ever mentioned them in Europe. The first time our authors observed it was, when they were on the summit of Pambamorea, a mountain not so high as Pichincha. A cloud, in which they were involved at break of day, dissipating, they saw the rising sun extremely splendid, and the cloud passed on the other side, opposite to the sun, where it appeared very thin, and was about twenty yards distant from the place where they were standing, when each of them saw in it, as in a looking-glass, his own image, and, what ap-

peared still more extraordinary, the head was encompassed with a glory, like that seen round the heads of saints in pictures; each head being, as it were, the centre of three concentric iris of very lively colours, and each with the same varieties as a rainbow, the red being outward; the last or most external colours of one touched the first of the following; and, at some distance from them all, was a fourth arch, entirely white. These were perpendicular to the horizon; and, as the person moved, the phænomenon moved also. But, what was very extraordinary, though there were six or seven persons, each could see in none but his own shadow, because the cloud had an uneven surface. The diameter of the arches gradually altered with the ascent of the sun above the horizon, and the phænomenon itself, after continuing a considerable time, insensibly vanished. Several of the gentlemen, both French and Spaniards, have particularly described this phænomenon, and M. Bouguer concludes with saying, "This was a kind of apotheosis to each spectator; and I cannot forbear mentioning again, that each enjoyed the secret pleasure of seeing himself adorned with all these crowns, without perceiving those of his neighbours. I must, however, observe, that this phænomenon never appears, but when the aqueous particles of the cloud are frozen."

Ulloa observes, that the roads over some of these mountains are not the least of those many extraordinary particulars relating to them. These are in many places so narrow, that the mules have scarcely room to set their feet, and in others there is a continued series of precipices. These roads are, likewise, full of holes, near three quarters of a yard deep, in which the mules put their

sore and hind feet, whence they sometimes draw their bellies and their riders legs, along the ground. These holes indeed serve as steps, without which the precipices would be in a manner impassable ; but, should the mule happen to put his feet between two of these holes, or not place them right, the rider falls, and, if on the side of the precipice, inevitably perishes. But the manner of descending appears still more dangerous. On one side are frequently steep eminences, and on the other dreadful abysses ; and, as they generally follow the direction of the mountain, the road, instead of being on a level, forms steep eminences, and declivities. The mules are sensible of the caution necessary in these descents ; for coming to the top of an eminence they stop, and having placed their fore feet close together, put their hinder feet a little forwards, as if going to lie down. Having in this attitude taken a survey of the road, they slide down with the swiftness of a meteor. All the rider has to do is to keep himself fast in the saddle ; for the least motion is sufficient to disorder the equilibrium of the mule, in which case, they both unavoidably perish. Nothing, says our author, can be more amazing than the animal's address on this occasion, for during this rapid motion, when he seems to have lost all government of himself, he follows with the utmost exactness the different windings of the road, as if he had accurately settled in his mind all the turnings he was to follow, and taken every precaution for his safety. Yet the longest practice in travelling these roads cannot entirely free the mules from a kind of dread, which they experience on arriving at the top of a steep declivity ; for they not only attentively view the

road, but tremble and snort at the danger. If the rider inadvertently endeavour to spur them on, they continue immoveable, till, at length, having overcome the first emotions of their fear, they stretch out their fore legs, that by preserving a proper balance, they may not pitch head forwards; and it is wonderful to consider how they make with their body, all the gentle inclinations necessary to enable them to follow the several windings of the road, and afterwards their address in stopping themselves at the end of their impetuous career.

The tediousness and danger of the way, however, is in some parts, alleviated and rendered more tolerable by the fine prospects and agreeable cascades naturally formed among the rocks and mountains. In some parts, the water in the valleys springs up to a great height, like artificial fountains, amongst odoriferous plants and flowers, that yield a delightful prospect. Many of these streams and springs are so exceedingly cold, that a man can scarcely drink them, or hold his hand in them above a minute; but in some places there are hot springs, which leave a green tincture in the channel through which they pass; and are reckoned good against many distempers.

From most of the mountains flow large and rapid rivers, and we read of a natural bridge of rocks over one of them, from the vault of which hang several pieces of stone resembling icicles, formed as the water drops from the rock, into various shapes and of different colours. This bridge is broad enough for three or four carts to pass abreast: and there is another bridge near it, laid over by art (as some say) between two rocks, but our author, who saw it, thinks it is rather the work

of nature. It is so far above the river that he could not hear the stream, though it runs with great rapidity ; and, though the river be of a considerable breadth, it appeared like a brook, when he looked down from the bridge, which he could not do without horror.

The bridges made by art are generally far from being commodious. Of these there are two kinds, besides those of stone, which are very few. The most common are of wood, and the rest of the bejucos, a plant we shall particularly describe when we come to treat of the vegetables of South America. With respect to the first, they choose a place where the river is very narrow, and has on each side high rocks. These bridges only consist of four long beams laid from one precipice to the other, forming a path about a yard and a half in breadth, just sufficient for a man to pass over on horseback ; and custom has rendered them so familiar, that people pass them without any apprehensions. Those formed of bejucos are never used but where the breadth of the river will not admit of beams being laid across. Several of these bejucos are twisted together, in order to form a large cable of the length required ; and six of them are drawn from one side of the river to the other, two of which being considerably higher than the other four, serve for rails. Across those at the bottom, are wattled sticks of bejucos, and the whole is not unlike a fishing-net, or Indian hammoc, stretched from one side of the river to the other ; but, as the meshes of this net are very large, and the foot would be in danger of slipping through, they cover the bottom with reeds, which serve for a floor. The mere weight of this kind of basket bridge, and much more the

weight of a man passing over, must cause it to make a prodigious bend; and, if it be considered that the passenger, when in the midst of his course, especially if there be a wind, is exposed to be swung from side to side, a bridge of this sort, sometimes above ninety feet long, must appear extremely frightful; yet the Indians run over it, loaded with the baggage and pack-saddles of the mules, laughing to see the Europeans afraid of venturing. The greatest part of these bridges are only for men and women, the mules swimming over the rivers; for their loading being taken off, they are driven into the water about a mile and a half above the bridge, in order that they may reach the opposite shore near it, they being usually carried so far by the rapidity of the stream.

Instead of a bejuco bridge, some rivers are passed by means of a tarabita, which is a single rope, either made of bejucos, or thongs cut from the hide of an ox, and consisting of several strands, which, when twisted, form a rope of six or eight inches in thickness. This is extended across the river and fastened on one side to a strong post, and on the other to a wheel, that it may be strained or slackened as occasion serves. From the tarabita, hangs a kind of leathern hammoc, large enough to contain a man, and suspended by a clue at each end, hanging in a loop over the tarabita. A rope is also fastened to it, and extended over the river, for drawing the hammoc to the side intended; which, with a push at its first setting off, sends it quickly to the other side. This not only serves to carry over persons, but the burthens of beasts, and also the animals themselves, where the rapidity of the current, and the

prodigious stones continually carried along by it, render it impracticable for them to swim over. For carrying over the mules, two tarabitas are used, one for each side of the river; and these are much thicker and stiffer. On this rope is only one clue or loop, which is of wood; and by this a beast is suspended, being fastened to it with girths round the belly and neck. When this is performed, the creature is pushed off, and almost immediately landed on the opposite side. Animals accustomed to be conveyed over in this manner never make the least opposition, but come of themselves to have the girths fastened round them: yet they are at first brought with great difficulty to suffer this to be done, and, on their finding themselves suspended in the air, kick and plunge violently during their short passage.

But, according to Acosta, there is still a greater danger in travelling over some of the mountains of Peru, than any we have yet mentioned. He tells us, that there are mountainous uninhabited deserts, where a sudden blast of air sometimes strikes a traveller dead in an instant; and that the Spaniards formerly passed these mountains in their way to Chili, but now either go by sea, or take another road by land, to avoid the danger of crossing them, in which journey many have perished, and others have lost their fingers and toes, and have been rendered cripples. The same author relates, that general Costilla marching over them with his army, great part of his men suddenly fell down dead, and their bodies remained there without stench or corruption. As incredible as this appears, it seems to be confirmed by the reports of European

scamen, who assure us, that they have seen great numbers of bodies of men, women, and children, lying dead upon the sands in Peru, and looking as fresh as if they had not lain there a week ; but, when they were handled, they proved as dry and light as a sponge or piece of cork. Whatever was the cause of the death of these people, it is agreed on all hands, that the dryness of the Peruvian air, and the heat of the sands, preserved their bodies from putrefaction.

The audience of Lima enjoys extraordinary advantages in being free from tempest, thunder, lightning, snow, hail, and rain ; but we have already observed that it is subject to earthquakes, which happen so frequently, that the inhabitants are under continual apprehensions of being buried in the ruins of their own houses : yet they are said to have their presages ; one of the chief of which is a rumbling noise in the bowels of the earth about a minute before the shocks are felt, and seems to pervade all the adjacent subterraneous parts. This is followed by the howlings of the dogs, who appear sensible of the approaching danger ; and the very beasts of burden, passing the streets, are observed to stop, and, by a natural instinct, to spread open their legs, the better to secure themselves from falling. These portents are no sooner observed, than the terrified inhabitants fly from their houses into the streets, with such precipitation, that, if it happens in the night, they appear quite naked, fear and the urgency of the danger banishing all sense of decency. This sudden concourse is accompanied with the cries of children, awaked from sleep, mingled with the lamentations of the women, whose agonising prayers to the saints increase the common

fear and confusion; and, the men being also too much affected to refrain from giving vent to their terror, the whole city exhibits a dreadful scene of horror and consternation.

The earthquakes that have happened in the city of Lima, are very numerous; but we shall only mention two of them. One of the most terrible was on the twenty-eighth of October, 1687, and began at four in the morning, with the destruction of many of the finest public buildings and houses, in which a great number of the inhabitants perished; but this was little more than a presage of what followed; for, two hours after, the shock returned with such impetuous concussions, that all was laid in ruins, and the inhabitants began to think themselves happy in the preservation of their lives, and being only spectators of the general devastation, and the loss of all their property. But during this second shock, the sea, retiring considerably, and then returning in mountainous waves, entirely overwhelmed Callao, and the adjacent country, together with the miserable inhabitants.

From that time six earthquakes happened at Lima before the dreadful one of 1746. This was at half an hour after ten at night, when the concussions began with such violence, that in little more than three minutes the greatest part, if not all the buildings, in this fine and beautiful city, were destroyed, and those of the inhabitants who had not made sufficient haste into the streets and squares, were buried under the ruins. At length the terrible effects of this first shock ceased, but the tranquillity was of short duration, the concussions swiftly succeeding each other, and the fort of Callao sinking into ruins; but what the city had

suffered from the destruction of its buildings, was inconsiderable, when compared with the dreadful catastrophe which followed ; for the sea, as usual, receding to a considerable distance, returned in mountainous waves, foaming with the violence of the agitation, and suddenly turned Callao and the neighbouring country into a sea. This, however, was not perfectly performed by the first swell of the waves ; for the sea, retiring still farther, returned with greater impetuosity, and covered both the walls and ruins of the place ; so that what had even escaped the first, was now totally overwhelmed, by those terrible mountainous waves. In the harbour were twenty-three ships and vessels, great and small ; nineteen of which were sunk, and the other four carried to a considerable distance up the country. This terrible inundation extended to other parts of the coast, and several towns underwent the same fate with the city of Lima.

The rivers of South America, especially those which take their rise to the eastward of the mountains we have been speaking of, deserve particular notice, some of them being the largest in the world, both with regard to their depth and breadth, and the length of their course ; but most of those that rise on the west side of the Andes are rather torrents than rivers, made by the annual rains that fall on the mountains.—The Rio Grande or Magdalena, which has its source in the province of Quito in Peru, near the equator, runs directly northward above a thousand miles, and falls into the sea between Cartagena and St. Martha.—The celebrated river Oronoque which has its source not far from that of Magdalena, after a winding course of fifteen hundred miles or upwards, falls into the

north sea near the isle of Trinidad, forming a large gulf, in which there are many small islands.—but the most amazing river, and generally supposed the largest in the world, is that of the Amazons *, which rises about ten leagues from Quito in Peru, and after many windings and turnings keeps its course to the east; till it falls into the Atlantic ocean between the coasts of Guiana and Brasil. Its channel, about sixty leagues from its head, is three miles broad ; and, as it receives many large rivers in its course, it grows wider and wider as it advances towards the ocean, where its mouth is

* It may not be amiss to acquaint the reader with the origin of the name of this river, and of the country through which it flows. The Amazons, according to the ancient historians, were a nation of warlike women, who founded an empire in Asia Minor, along the coasts of the Black Sea, out of which men were excluded. What commerce they had with that sex was only with strangers at some appointed times, and all their male children they killed, and cut off the right breast of the females, that their arm might be the stronger and more at liberty in battle. It is a point controverted indeed, even amongst ancient writers, whether such a nation of Amazons ever existed, but the greatest part of them are on the affirmative side of the question. M. Petit, a French physician, published a Latin dissertation in 1685, to prove that there really was such a race of female warriors, wherein he has made curious enquiries relating to their habit, their arms, the cities they built, &c. Begins as it will, the Spaniards, who first discovered and sailed up the American river we are speaking of, were told of such a barbarous nation of women by some of the natives, on purpose to frighten them; and they actually found the women in several places bordering on the river, as fierce and warlike as the men, it being their custom to accompany their husbands to battle, and to share their fate; and hence proceeded the name of the country and river of the Amazons.

fifty or sixty leagues in breadth. Even before it leaves Peru, its depth is ten or twelve fathoms, from whence it increases to twenty, thirty, fifty, and sometimes much more, before it reaches the ocean. From its source to its mouth it is eight or nine hundred leagues in a direct line; but the windings make it about twelve hundred, or eighteen, according to some computations.

There is another river of South America little inferior to the former in breadth and depth, though it does not equal it in length, viz. that called Rio de la Plata, which, reckoning only from the confluence of the two rivers that form it, runs above two hundred leagues, and is all the way navigable for the largest vessels, and full of delightful islands. In its course it receives several considerable rivers, and sometimes swells to such a height as to overflow a great deal of land on each side, during which time the natives betake themselves to their canoes, and when the inundation abates, return to their old habitations. It falls into the ocean by a mouth thirty leagues broad, running with such strength and rapidity, that it takes off the saltiness of the sea to the distance of several miles. A certain author tells us, that the water of this river is very clear, sweet, and excellent for the lungs, so that the people who drink it have melodious voices, and are generally inclined to music; but such an account is too whimsical to be regarded. He adds, that it petrifies the branches of trees that fall into it, and that vessels of various figures are naturally formed of its sand, which keep water cool, and look as if they had received an artificial polish.

We shall only mention one more river, or at least a considerable stream of water, remarkable

for its subterraneous passage. This is in the western parts of Tucumán, a province of Paraguay, where it seems there is a very large and lofty mountain, which, from its glittering when the sun shines upon it, is called the crystal mountain. Under this is extended a frightful cavern, through which runs a river with so many windings and turnings that the water is twenty-four or thirty hours in its passage from one side of the mountain to the other, according to the computation of some Portuguese, who were rash enough to make the experiment, by hazarding their persons on a rafter made of canes.

As to the qualities of the waters in the southern part of America, it is observed that some lakes in the valleys are extremely hot, particularly one near Potosí in Peru, which perfectly boils up in the middle, where the spring rises; but the heat is so moderate near the shore, that the inhabitants bathe in it frequently. In the sandy plains near the coast of Peru there are very few springs, but a great variety in that part which is remote from the sea; amongst which there is one near Oropesa, whose water is very hot, and after running a little way it petrifies and forms a rock. It is said the natives use the stone in building their houses, it being soft, light, easily wrought, and yet very durable. Travellers also tell us of springs of liquid matter much resembling tar, and put to the same uses by sea-faring people.

At the baths of the Incas, (an appellation given to the ancient kings of Peru,) there is a spring of water that issues out hot and boiling, and another near it as cold as ice, which used to be tempered and mingled together for those princes to bathe in.—Near Cusco there is said to be a fountain, whose

waters, after a short course, turn into salt.—From the top of the mountain Balconotta, by some reckoned the highest in Peru, there rise two springs, which run different ways, and soon form two considerable streams. Their waters, when they first issue from the rocks, are of an ash-colour, hot and smoking, and smell like burning coals; which smell they retain a great way from their source, till they mingle with other streams, and become cool.—To these we may add another fountain in Peru, which sends forth a stream almost as red as blood, from whence it has obtained the name of the Red river.

MINERALS, FOSSILS, &c.

ALMOST every part of South America affords mines of gold and silver, but those rich metals are most abundantly found in Chili and Peru, as well as large quantities of copper, tin, lead, and quicksilver. It is observed, that gold is most frequently found native of all the metals, being rarely met with in a state of ore, and then intermixed with the ores of other metals: but, though native gold be free from the penetrating sulphurs which reduce other metals to ores, it is very seldom found pure, but has almost constantly a mixture of silver with it, and frequently of copper. If it have any considerable quantity of copper in it, it is easily discovered by its hardness; but the silver is not so readily detected. Sometimes native gold is found in the mines in pure masses, so large as to weigh twelve, fourteen, or sixteen ounces; but these are very rare. Its more common appearance in its

loose state is in form of what is called gold dust, that is, small particles mixed among the sand of rivers, which is very frequent in Guinea, as we have already observed, and many other parts of the world. But native gold is also found in a middle state, as to size, between the two kinds just mentioned, in the cliffs or perpendicular fissures of the solid strata in the mountains of Chili. These fissures are usually filled with a reddish earth, the native gold being either loose amongst it, or immersed in a debased crystalline stone of a bluish hue, and generally in flattish pieces, from the size of a small pea to that of a horse bean. When they have dug out this red marle, it is carried on mules to the lavaderos (as they call them) a sort of basons of water *, where it undergoes several repeated lotions in different waters, till the earthy and impure parts are all separated and carried away by the stream, and the gold left at the bottom.

In these forms gold frequently appears in those parts of the world where it abounds, but still the greatest quantities of it are found bedded in masses of hard stone, which lie at vast depths, being often dug at a hundred and fifty fathoms. There is

* These lavatories or basons, according to M. Frezier, are made somewhat in the form of a smith's bellows, into which a little rivulet of water runs with a great deal of rapidity, dissolving the parts of the earth, and carrying every thing away with it except the particles of gold, which by their weight precipitate to the bottom. Sometimes large pieces of gold are found in these lavatories, which usually turn to very great profit when there is no want of water, the expences of getting gold this way being but trifling, compared with those accruing in the common method, by machines, fire, and quicksilver.

no peculiar stone in which it is immersed, but it is met with indiscriminately in several kinds, some softer, some harder, and even in earths. The richest masses are usually a whitish but opaque stone, which is a debased crystal, containing a great deal of white earth, often tinged likewise with black, and sometimes with other colours. In this stone the gold lies in a great variety of figures, sometimes like small branches, at other times interwoven in narrower or broader veins, or in little flat spangles intermixed with specks of black. But, besides this sort, there are many coarser stones in the mines of Peru, which contain considerable quantities of gold, visible in large or small spots; and these are of all colours, but generally white or reddish. In these stones the gold is commonly in small spangles.

In order to separate the gold when dug out of the mines, they first break the metalline stone or ore with iron mallets, and then carry it to the mills, where it is ground to a very fine powder, which is afterwards passed through several brass wire sieves, as fine as any we have made of silk. The powder thus prepared, is laid in wooden troughs, with a proper quantity of mercury and water, where it is worked together, and there left to saturate in the sun and air for forty-eight hours. During this time the mercury imbibes all the gold, without cohering with the coarser earth or sand, which, upon inclining the trough, is easily washed away with the water. The mass which then remains concreted at the bottom is nothing but gold, mercury, and some fine earth, which last they disengage from the mass by repeated effusions of hot water, and the mercury they separate by distillation in large alembics. The gold in this state,

though not yet perfectly pure, is called virgin-gold, as well as that found in the sand of rivers, or that in grains in the mines, as none of them have passed the fire. After this they usually fuse it in crucibles, and cast it into plates or ingots.

The next metal to gold in value is silver, and of this the mines of Peru and some other parts of America afford the greatest quantities of any in the world. This metal, as well as gold, is found native more frequently than in a state of ore; what are commonly called silver-ores, being no other than stones of various kinds, in which are bedded large quantities of native silver. Sometimes it is also contained in the softer fossils, as earths; and sometimes it is found loose among strata of sand. That which is lodged in stone is usually disposed in flat masses variously streaked, ridged, and often resembling silver lace; that in earths is frequently branched, and that among sand in small roundish or oblong granules. However, though silver is often found thus native and pure, it is likewise frequently met with in a state of ore, and sometimes embodied in the ores of other metals.

The proper and peculiar ores of silver are also very various in their appearance, but its most usual ore is a singular and remarkable body, being naturally malleable. The colour of this is a blackish blue, and it so nearly resembles lead that many have mistaken it for that metal in its native state. It is found in large irregular masses, sometimes of a laminated structure, extremely heavy, and very rich in metal, containing often three fourths of pure silver; but among these are usually found some of a more debased nature, containing much less silver, and distinguished from the rest by their not being malleable and of a paler colour.

Another appearance of silver in the state of ore is in brownish masses, obscurely transparent, and somewhat resembling the coarser sorts of amber. These are usually of an irregular shape, often in the form of common pebbles, but sometimes flattened and with rugged edges. This sort of ore breaks with a slight blow, and is also very rich in silver, usually containing near two thirds of its weight in metal. But there is yet another appearance of silver-ore, superior to all other ores in beauty, being a compact substance, of a regular texture, of a very bright red, a smooth even surface, and considerably pellucid. This very much resembles the native sandarach*, and is sometimes exactly of the fine florid red of that body, but more frequently approaches to a crimson.

These are the more usual appearances of silver in a state of ore, but it is found with numberless accidental variations; and there are stones of all colours and consistencies wrought in different places for the silver they contain. In the mines of Peru, some of the ores, as they are called, are grey spotted with blue and red; others have various shades of red, with mixtures of yellow or brown; and others are black, green, or yellow. Some of these are of the nature of one or other of the ores above described, only debased by adventitious mixtures; the others are stones wherein native silver is lodged, which are commonly confounded with the rest under the name of silver-ores. The black ores are the richest and most

* This is a preparation of orpiment, and is the same with what is otherwise called red arsenic; but there is also a white gum named sandarach, obtained from the trunk and thick branches of the great juniper-tree, by incisions made in the heats of summer.

easily wrought, and the silver they yield is of the best quality. The veins of silver are usually richer in the middle than towards the extremities; but the richest places are those which the veins intersect.

The most celebrated mines of Peru are those of Potosi, which have now been opened nearly two hundred and sixty years, and yet continue to be wrought with equal advantage as when first discovered; only with this difference, that the veins, which were then almost on the surface of the mountain, are now sunk to prodigious depths, some of the pits or wells being two hundred fathoms deep, and yet not incommoded with water. What renders the working of the mines exceeding dangerous are the exhalations arising from them, which are even felt on the outside, and affect animals that graze in the neighbourhood; but within they stupefy the miners, none of whom can bear so noxious an air above a day together. Sometimes it is so fatal as to kill on the spot, and oblige them to stop up the veins from whence it exhales. The mines of Potosi are the least subject to these vapours, and yet, without the herb paraguay, the infusion whereof is drank by the miners as we do tea, these mines must soon be abandoned. Some millions of Indians have perished in them, and prodigious numbers continue to be destroyed every year.

The mountain of Potosi, which is famous for the immense quantity of silver it has produced, was first discovered to contain that metal, by a mere accident. An Indian, named Gualeca, pursuing some wild goats up this mountain, and coming to a very steep part, laid hold of a shrub, in order to ascend with the greater celerity; but, it

being unable to support his weight, came up by the roots, and discovered a mass of fine silver; and at the same time he found some lumps of the same metal among the clods which adhered to the roots. The Indian, who lived at Porco, hastened home, washed the silver, and made use of it, repairing, when his stock was exhausted, to his perpetual fund. At length, an intimate friend, perceiving the happy change in his circumstances, eagerly enquired the cause; and repeated his questions with such earnestness, that Gualca, confiding in his friendship, revealed the secret. For some time, they resorted to the mountain for fresh supplies, till, Gualca refusing to discover his method of purifying the metal, the other, in revenge, revealed the whole secret to his master who went, in April 1545, to view this fortunate breach in the mountain; and the mine was instantly worked with immense advantage. The first mine had the name of The Discoverer, from its occasioning the discovery of other sources of wealth enclosed in the bowels of this mountain; for, in a few days another was found no less rich, and was named the Tin mine; afterwards another was found and distinguished by the name of Rica, or Rich, as exceeding all the rest. At length, another was discovered, which was called the Mendieta. These are the principal mines of this celebrated mountain; but there are several smaller, crossing it in all directions.

The importance of these discoveries induced people to flock to Potosi from all parts, particularly from the city of Plata, which stands about seventy-five miles from the mountain, whence the town of Potosi is at present near six miles in circuit, and inhabited by many noble families, particularly those

concerned in the mines. The air at the mountains is indeed so cold, as to render all the adjacent country remarkably barren; for it produces neither corn, fruit, nor herbs, and yet the town is so plentifully supplied, as to be in want of nothing, the trade for provisions being greater there than in any other place, Lima excepted. Some provinces send the best of their corn and fruit, others their cattle, others their manufactures; while others resort thither with European goods, as to a sure market. A Spanish author declares on the best authority, that, before the year 1638, it appeared by the public accounts that the silver, produced by this mountain, amounted to three hundred ninety-five millions six hundred and nineteen thousand dollars; which in ninety-three years, the time it had then been discovered, amounted to forty-one millions two hundred and fifty-five thousand and forty-three dollars per annum. Hence an idea may be formed of the immense trade that has for many years been carried on in this town, which consists entirely of the silver extracted from this mountain, and is still very considerable, though some diminution has been perceived in its produce.

In the province of Carangas, which is remarkably cold, there are many silver mines constantly worked; among which, one called Turko, is remarkable for the ore named by miners Machacado, the fibres of the silver forming an admirable intertexture with the stones in which they are contained. Besides, in the barren, sandy deserts, extending towards the coast of the South sea, are found, by digging in the sand, detached lumps of silver, unmixed with any ore or stone, but what adheres to the metal, they having all the appear-

stance of melted silver, with black terrene particles on the outside. The size and figure of these lumps are very different, some weighing about two marks, or sixteen ounces, and some above a hundred marks. These lumps of silver are found in different parts of the same ground, though seldom near each other.

The manner of separating silver from its ore is nearly the same as in gold. They break the ore in the stamping-mill till it is reduced to powder, and then mix it up with mercury into a sort of paste, which they knead in the troughs till the water has by degrees washed away all the earthy particles. After this they strain off part of the mercury from it through a woollen bag to serve again, and the rest is made to evaporate by fire. The silver that remains behind is, last of all, perfectly refined from all heterogeneous matter by a solution of lead, which, exhaling from it, carries off in fumes the copper or other alloy.

Another part of the riches of Peru are its mines of quicksilver, which afford surprising quantities of that useful mineral. Those of Guancavelica or Oropesa are the most famous, and are more considerable than the rich mines of Carniola in Europe, of which we have already given an account*. Frezier tells us that the mines of Guancavelica supply all the gold and silver mills in that kingdom; but this seems to be a mistake, since other mines are wrought which produce plenty of quicksilver. The earth containing the quicksilver is of a whitish red, like bricks half burnt, which being pounded is put in an earthen furnace, whose top is vaulted like an oven. They spread it on a

* See Vol. II. page 117.

layer of common earth, wherewith the grate of the furnace is covered, under which they keep a small fire made of the shrub *icho*, which is of such necessity in these works, that the cutting it for any other use is prohibited for the space of twenty leagues round. In proportion as the pounded mineral heats, the mercury rises volatilized into smoke, and finding no vent through the capital of the furnace, which is exactly luted, it escapes through a hole made for that purpose, communicating with several earthen cucurbits, each having a little water at the bottom. By means of this water the smoke is condensed, and the quicksilver precipitates, and is taken out when the operation is over.—It is remarkable in this process, that the farther the cucurbits are from the furnace, the more they are filled with quicksilver; and they all grow so hot that they would break, if they were not occasionally sprinkled from time to time with water.—The workmen employed in this business frequently become paralytic, and fall victims to their unwholesome employment.

Having been so particular in our account of the gold and silver of the south part of America, it will not be expected we should say much concerning the baser metals, especially as we have spoken of them sufficiently in Europe. It may be proper to observe however, that Chili abounds with copper, of which the Spaniards make their great guns for those parts of their dominions, the bells of their churches, and family utensils; so that, since the working of the mines of Chili, no copper has been sent from Spain, as they afford the Indies a sufficient supply of that metal.

As to precious stones, though we have no-

ticed most of them in our description of India, it is proper to observe, that Peru is noted for its emeralds. The ancients indeed, and Pliny in particular, mistakenly reckoned up various kinds of emeralds, but the modern naturalists and jewellers only know of two, the Oriental and the Peruvian.

Diamonds have lately been discovered in Brasil, and are found in the same manner as the Brazilian gold, in the gullies of torrents, and beds of rivers; but only in particular places, and they are not so universally spread through the country. It is said that they were frequently found in washing the gold, before they were known to be diamonds; and were thrown away with the sand and gravel. It is still remembered, that many large stones, that would have enriched the possessors, passed unregarded through the hands of those who afterwards bore with great impatience the mortifying reflection. However, about ninety years ago, a person acquainted with rough diamonds imagined that these pebbles, as they were then thought, were of the same kind: but it is said there was a considerable interval between the first starting of this opinion and its being confirmed by proper trials; the inhabitants being, with difficulty persuaded to believe that what they had despised could be of such importance; and, during this interval, a governor is said to have procured a great number of these stones, under the pretence of making use of them in playing at cards, instead of counters. It was, however, at last confirmed by some European jewellers, that they were real diamonds; and many of them not inferior, either in lustre or any other quality, to those of India, except their having generally a yellowish cast.

Immediately the Portuguese, in the neighbourhood of the places where they had been found, began to search for them, with great eagerness ; and even hoped to discover considerable masses of them, from their perceiving large rocks of crystal in many of the mountains, from whence came the streams that washed down the diamonds. It was soon, however, represented to his Portuguese majesty, that, if such plenty of diamonds, as was expected, should be found, this would not only debase their value, and ruin all the Europeans who had a quantity of India diamonds in their possession, but render the discovery of no importance. The king, therefore, restrained the general search for them, by erecting a diamond company, with an exclusive charter, who, in consideration of their paying his majesty a certain sum, have the property of all the diamonds found in Brasil : but, to prevent their collecting too large quantities, and thereby reducing their value, they are prohibited from employing above eight hundred slaves, in searching for them. And, to secure the company from being defrauded by interlopers, he depopulated a large town in its neighbourhood, with a considerable district round it ; and obliged the inhabitants, who were said to amount to six thousand, to remove to another part of the country.

VEGETABLES.

AMONG the vegetable productions of South America, there is none that more justly deserves our notice than the tree which yields the cele-

librated febrifuge, popularly called Jesuits bark. It is also called quinquina, and palo de calenturas, or fever-wood, on account of its extraordinary virtue in removing all kinds of intermitting fevers and agues. The tree which produces this noble specific grows only in the interior parts of Peru, on the mountains near Loxa, in the province of Quito ; at least the best sort (for there are different species of this tree) is no where else to be found, according to the account of Mr. Arrot. It is a pretty tall tree, and has a trunk rather bigger than a man's thigh, tapering from the root upwards, and free from branches till near the top, where they shoot out as regularly as if they were lopped, forming with the leaves the figure of a hemisphere. The bark is of a blackish colour on the outside, and sometimes mixed with white spots, from whence commonly grows a kind of moss, which the Spaniards call barbas. Its leaves are much like those of our plum-tree, of a darkish-green colour on the upper side, and reddish on the lower. It bears a red flower, which is succeeded by a sort of pod, enclosing a seed somewhat like a hop-seed ; though Dr. Oliver represents its fruit as resembling a chestnut. The soil where the best sort thrives is generally a reddish earth or rocky ground, and frequently on the banks of the rivulets that fall from the mountains. Mr. Arrot adds, that it flourishes and bears fruit at the same time all the year round.

The bark-trees do not grow together in great numbers, but are intermixed with others in the woods. Sometimes indeed it happens that clusters of them are found together, but at present they are much scarcer than formerly, a great many

fine large ones having been entirely cut down, in order to come at the bark the more easily. The properest season for cutting the bark is from September to November, the only time in the year that there is some intermission from rain in the mountains. Having discovered a spot where the trees most abound, the workmen build huts near it for themselves, and a large hut to put the bark in, to preserve it from the wet: but they remove it from hence as soon as possible to the nearest plantation or farm-house in the low country to dry, which is done by spreading it abroad in the open air, and turning it frequently.

The Indians, who are the cutters, are each provided with a large knife, and a bag that will hold about fifty pounds of green bark. Two of them take one tree, from whence they cut down the bark as far as they can reach from the ground; and then taking sticks about half a yard long, they tie them to the tree with tough withies at proper distances like the steps of a ladder, always slicing off the bark as far as they can reach, before they fix a new step. Thus they mount to the top, the Indian below gathering what the other cuts; and this they do by turns, going from tree to tree, till their bag is full; which, when there is plenty of trees, is generally a day's work for one Indian. Our author tells us, that, after a tree is stripped of its bark, it requires eighteen or twenty years to grow again; which is quite different from Dr. Oliver's account, who says it grows again in four months*.

* Dr. Oliver had his account of the bark-tree from an apothecary at Cadiz, who had been in Peru; but Mr. Arrot relates what he himself had observed and been told whilst he lived in that country. Who is most to be credited, therefore we leave to the reader's judgment.

Mr. Arrot had the curiosity to send a considerable quantity of bark from the woods to the city of Loxa, where he put it into a large open house, and dried it under cover, never exposing it either to the sun or night air; imagining that the sun exhaled many of its fine parts, and that the night-air was very pernicious to it: but he found the colour of the bark, thus cured, not near so bright and lively as that dried in the open air. This best sort of bark, he imagines, will last but a short time, or at least it will be extremely hard to be got, by reason of its distance from inhabited places, the impenetrability of the woods where it grows, and the small number of Indians to cut it.

It is not certain how the qualities and use of this remarkable bark came first to be known, but it is the common opinion at Loxa that they were known to the Indians before ever the Spaniards came amongst them; and that it was by them applied in the cure of intermitting fevers, which are frequent in those wet parts of Peru. According to the account of the Spaniards, however, the virtues of the Peruvian bark were discovered in the following manner. Near the town of Loxa (say they) was a lake surrounded with quinquina-trees, which, being blown down or accidentally thrown into the lake, communicated a bitter taste to the water, so that the inhabitants, who used to drink it, could use it no longer. But a certain Indian, who had a violent fever upon him, and consequently an intense thirst, finding no other water, was forced to drink of this, by which he was perfectly cured. He related this accident to some of his neighbours, and several persons afflicted with fevers made the same experiment

with similar success. Hereupon they set themselves to discover what had given this febrifugous quality to the water of the lake ; and found in the first place that a great number of trees had fallen into it ; and, secondly, that in a course of years, these trees being rotted in the water, it lost its bitter taste, and at the same time its virtue ; whence they concluded, that its quality was owing to the trees. Then they infused all the parts of these trees in water, and found that their whole efficacy resided in the bark.

This medicine, however, remained a secret to the Spaniards, till the year 1640, when it was discovered by a soldier, who by its means had the good fortune to cure the vice-queen of Peru of an intermitting fever, which had baffled the skill of her physicians. From this time the Spaniards began to use it with wonderful success ; and in 1649, father de Lugo, a Jesuit, then procurator general of his order, and afterwards cardinal, brought it to Rome ; upon which the society of Jesuits soon raised its reputation in Europe, and got a great deal of money in a short time, selling it for more than its weight in gold, and never parting with it but in powder, in order to disguise it the better. At this juncture the physicians were divided with respect to the Peruvian bark, some looking on it as a most valuable medicine, whilst others believed it dangerous, and even fatal in many cases ; but its reputation was only lost through the ignorance of the manner of preparing and prescribing it ; for, about the year 1679, Mr. Talbot, an English physician, brought it into vogue, by the great number of cures he wrought about the court and city of Paris, with the powder prepared after his manner ; the secret whereo-

was afterwards made public, by the munificence of Louis XIV. who rewarded Talbot for the communication with five thousand crowns.

The reputation indeed, which this medicine has universally obtained, has been chiefly owing to the judicious and successful experiments made by the English physicians: but it still has its enemies, who pretend that it brings on violent relapses, or new and incurable diseases; such as tumours of the feet, dropsies, obstinate costiveness, hypochondriac and hysterick disorders, slow and hectic fevers, accompanied with a loss of strength and appetite, and sometimes convulsions and epilepsies in children. But it is certain that the Peruvian bark, exhibited duly and in conjunction with other suitable remedies, has a tendency to remove the causes of fevers by promoting perspiration, and restoring the due tone of the solids.

It ought never to be given in large quantities, but rather at several times, one or two scruples only on the intercalary day, every three hours after the fit, drinking after it a sufficient quantity of water, broth, or beer. Besides the peculiar febrifuge quality of the bark, it is of peculiar service in stopping the progress and perfecting the cure of gangrenes and mortifications.

This noble medicine is sold either in bark or in powder. If bought in the bark, it must be chosen dry and compact, such as has never been damaged by wet, and is not too easily reduced into powder by breaking. The small blackish barks, shagreened without, and reddish within, of a bitter disagreeable taste, are the most esteemed. But the little sort, which curls up like sticks of cinnamon, and is supposed to be

peeled off the branches, Mr. Arrot tells us is only the bark of the younger trees, which twists up in that manner on account of its thinness; for he says the bark of the branches would not answer the trouble and expence of cutting.---As to the powder, it ought to be well sifted, and bought of persons that may be trusted, it being often sophisticated, and the imposition not readily discovered.

There is another bark called Winter's bark, or Winter's cinnamon, because brought by captain Winter from the Straits of Magellan, where the tree grows in great abundance: but it is to be observed, that the wild cinnamon sold in the shops is not the true *Cortex Winterianus*, though passed off under that name. There are barks of different trees, growing in very distant places, by outward appearance seeming quite different from each other, and even alike with regard to taste, so that they may be used as a succedaneum to each other: but the true Winter's bark is much to be valued beyond the false, which is generally sold in shops, being far more aromatic. It is resolvent, dissettient, and sub-astringent; on which account it is successfully administered in disorders of the stomach, nauseas, diarrhœas, and excessive vomitings. To strengthen the stomach, it is likewise used in the declemson and at the end of intermitting fevers; and it is reckoned beneficial to scorbutic patients.

We ought not to omit another excellent root growing plentifully in Brasil and Peru, namely, *sarsaparilla*, which began to be much celebrated about the same time with the China root, as appears from an epistle of Vesalius. The root divides itself into a great number of filaments, six

or seven feet long, brownish without, and white within, only marked with two red streaks; and its branches creep along the ground, or up the trunks of other trees like ivy. It is prepared by cutting two ounces of the root into small bits, and macerating them a whole day in six pints of water; which are afterwards to be boiled over a gentle fire in a double vessel well closed with a lid, till one third or one half be evaporated. Of this decoction the patient is to take a glass that will hold ten ounces, very early in bed; and the course is to be continued for twenty or four and twenty days.

In the southern parts of America we find several trees which furnish us with healing medicines, particularly the Peruvian balsam. Of this there are two kinds, the white and the black; but the former is accounted best, and is by way of eminence called balsam of incision, because flowing from a large tree upon making incisions in the bark. This species is limpid, of the consistence of turpentine, of a fragrant smell, and much scarcer and dearer than the black sort; but it is frequently adulterated with Venice turpentine. We have large quantities of the black sort imported, which is prepared by boiling the branches, bark, and leaves of the trees; but this is likewise often adulterated, which however may be known by its being thick and coagulated, and wanting its penetrating taste and smell. The true balsam of Peru, if used internally, restores impaired strength, and being very friendly to the nervous system, powerfully contributes to remove the disorders arising from its weakness. The black Peruvian balsam, according to Geoffry, is also of a

warming and strengthening nature, comforting the brain and nerves; and it is beneficial in asthmas, the cholic, and pains of the stomach and intestines. Used externally, it alleviates the cramp, relieves all kinds of convulsions, old pains, and contractions in the sinews. In cuts and green wounds it is also very serviceable.

The balsam of Capivi is produced from a tree growing in Brasil, and brought to us from Rio de Janeiro and other places in earthen vessels. There are two sorts of it, the one very limpid, the other pretty thick, but the difference depends upon the different seasons of gathering it. Hoffmann esteems the limpid kind both for internal and external purposes, it being an excellent liniment for the consolidation of wounds and ulcers, and for strengthening the nervous parts after they have been weakened by any disease. It is also beneficial when applied to parts that have been affected with the gout, and thereby rendered unfit for motion.

To these we may add the balsam of Tolu, the produce of a tree growing in Terra Firma, of a tough resinous consistence, of a yellowish colour, of a highly fragrant smell, and aromatic taste. This is an excellent pectoral medicine, and consequently of great service in all disorders of the lungs, as coughs, asthmas, and consumptions; and what renders it still more valuable is, that it has no nauseous oily taste, which is the case of most other native balsams. With sugar and the yolk of an egg it makes an agreeable emulsion; and it is reckoned restorative if taken inwardly, and deterges and consolidates wounds if applied externally. It strengthens the nerves, and is good against a rheumatism and sciatica. In taste

and smell it resembles the balm of Gilead, and, as it grows old, it becomes triable, and assumes the consistence of a dry balsam.

The grenadilla resembles, in shape, a hen's egg, but is larger. The outside of the shell is smooth, glossy, and of a faint carnation colour; and the inside white and soft; the shell containing a viscous liquid substance, full of very small and delicate grains, less hard than those of the pomegranate, and is separated from the shell by a fine transparent membrane. This fruit has a delightful sweetness, blended with acidity, very cordial and refreshing, and so wholesome, that the indulgence of one's appetite is not attended with the least danger.

The chirimoya is universally allowed to be one of the most delicious fruits in the world. Its dimensions are various, being from one to five inches in diameter. Its figure is inperfectly round, being flattened towards the stalk, where it forms a kind of navel; but all the other parts are nearly circular. It is covered with a thin soft shell, that adheres so closely to the pulp, as not to be separated from it without a knife. The outward coat is green, variegated with prominent veins, forming all over it a kind of net-work. The pulp which is white, contains a large quantity of juice, resembling honey, of a sweet taste, mixed with a gentle acid, of a most exquisite flavour. The seeds are formed in several parts of the pulp, and are somewhat flat. The tree is high and tufted, the stem large and round, but with some inequalities, and is full of elliptic leaves, terminating in a point. The blossom is nearly of the same colour as the leaves, which is a darkish green; and, though far from being beautiful, is remarkable for

its incomparable fragrance; whence these flowers are so much admired by the ladies that they purchase them at any price. The two fruits last mentioned are the produce of Quito, in Peru.

The cuca is an herb so highly esteemed by the Indians in some provinces of Peru, that they would part with any kind of provisions, the most valuable metals, gems, or any thing else, to obtain it. It grows on a weak stem, which supports itself by twisting round another stronger vegetable; and its leaf, which is about an inch and a half, or two inches in length, is extremely smooth. The Indians make use of it for chewing, mixing it with a kind of chalk, or whitish earth called mambi. They put into their mouths a few leaves of cuca, and a proper quantity of mambi; and chewing them together, at first spit out the saliva, but afterwards swallow it. This herb is so nutritive and invigorating, that they labour whole days without any thing else; and, on the want of it, find a decay in their strength; it also preserves the teeth sound, and fortifies the stomach. Great quantities of this herb are cultivated by the Indians in the southern provinces of Peru, and it makes no small article of trade; a great deal of it being carried to the mine-towns, that the owners of the mines may furnish the Indians with it, who otherwise could not be brought to work, or would not have strength to go through it. This plant is doubtless the same with the betel of the East Indies, where it is used in the same manner.

In the most southern parts of Popayan are certain trees, which yield a resin called mopa-mopa, of which is made a varnish, which is not only extremely beautiful, but will bear boiling water, and

even acids. The method of applying it is to dissolve some of the resin in one's mouth, and then wet the pencil with it : afterwards, it is dipped in the colour to be laid on ; and when dried has all the lustre of the Chinese lac ; but with this superior quality, that it never wears off, nor becomes moist, though rubbed with spittle. Hence the cabins, tables, and other furniture, made by the Indians of this country, are carried to Quito, where they are highly valued.

There is still to be mentioned a very celebrated plant of the shrub kind growing in some parts of South America, especially Paraguay, by which name it is called, though better known amongst us under the denomination of South-sea tea. Its usual height is about a foot and a half, its branches are very slender, and its leaves like those of senna. It may be looked upon indeed as a sort of Occidental tea, which, like the Oriental, is infused in hot water, and communicates to it a colour and smell nearly like those of the best tea brought from the East Indies. Of this plant, there are two kinds, the one called paraguay, the other camini, which last is most esteemed, and sold for a third more than the other. The first is chiefly used by domestics and slaves, but the latter is the drink of the richest people ; and both are of so much use, and esteemed of such necessity, that no-body in that part of America will live without them. In the mines of Potosi (as we have already observed) the poor slaves could not live without a constant supply of paraguay, which is their remedy against the mineral steams, that otherwise would suffocate them ; and it is said that no servant will engage himself with a master but on condition that he have paraguay

for his usual drink.—This plant makes a very considerable article in the commerce of that part of the world, and formerly passed almost wholly through the hands of the Jesuits. The use of it began once to obtain in England, and seemed to be approved of as well as tea ; but of late years it has not been much regarded. The preparation of it, and the making it into drink, is much the same with that of tea, except that both the leaves and wood are used, and the liquor drank immediately out of the vessel it is made in, which the company suck through a silver or glass tube, handed round from one to another. It is further to be observed, that, besides the virtues of the Eastern tea, the Americans attribute another to theirs, viz. that of purifying all kinds of water, how foul and corrupt soever ; so that, when they cross the deserts from Buenos Ayres to Peru and Chili, they make use of it to sweeten the bad water they meet with, and drink it without any injury. In the scurvy and putrid fevers it is also reckoned a sovereign remedy.

The American wood called brasil, has been commonly supposed to have had its name from that country, though Huet proves it was known many years before Brasil was discovered. It is variously denominated, according to the places whence it is brought, as Fernambuco, Japan, the Antilles, &c. but it always grows in a dry barren soil, and even in the middle of rocks. The tree is tall, usually crooked and knotty, and has a bark of a surprising thickness. It bears flowers of a very beautiful red, which smell agreeably, and are said to strengthen the brain. The wood itself is very heavy, crackles much in the fire, and scarcely raises any smoke, by reason of its extreme dryness. That

of Fernambuco is esteemed the best, and it is to be chosen in thick pieces, close, sound, and such as being chewed tastes something like sugar. It takes a good polish, and is much used in turned works, but more frequently in dying, as it gives a red colour, though not very lasting. In medicine it is said to mitigate the heat of fevers, and is strengthening and restringent.

Many more productions of the vegetable kind in this part of the world are very remarkable, particularly a large prickly shrub, as thick as a man's leg, and growing to the height of ten or twelve feet, but bearing neither leaf nor fruit.—The mamme is a tall strait-bodied tree, without knots or limbs for sixty or seventy feet, but afterwards spreading into several small branches, growing thick and close together. Its bark is of a dark grey colour, thick and rough; its fruit bigger than a quince, round, and covered with a thick rind. When the fruit is ripe, the rind is yellow, and will peel off like leather, but before it is brittle. Under the rind the pulp is also yellow, and in the middle are two large stones, flattish, and each of them much bigger than an almond. The fruit smells well, and the taste is not disagreeable.

In Terra Firma there are several sorts of mangrove trees, which we think it proper to notice, besides those we have mentioned in Africa. They are black, red and white, the first of which is largest, being as big as many of our oaks, and to the height of about twenty feet very serviceable timber, but extraordinarily heavy, and therefore not much used in building.—The red mangrove grows commonly by the sea-side, or by creeks and rivers, and proceeds from several roots, which, about eight or ten feet from the ground, join into

one trunk or body, so that the tree seems to be supported by so many artificial stakes. The inside of the bark is red, and is much used in the West Indies for tanning of leather.—The white mangrove does not grow so large as the other sort, nor is it of any great use.

The cacao or chocolate nut-tree, is found in several parts of the West Indies, but no where so plentifully as on the coast of the Carracas. This tree nearly resembles our dwarf apple-tree both in stem and branches; but the leaf which is of a deep green, is considerably broader and longer. The nuts, which are of the colour and about the size of an almond, hang fifteen or sixteen together by a small stringy film, enclosed in a pod shaped like a large cucumber, and pointed at the upper end. When the pod is ripe, it is of a beautiful yellow colour, intermixed with red streaks; but when dried it shrivels up, and turns to a deep brown. Others tell us that each pod contains from twenty to thirty nuts, and that a thriving tree generally yields from two to eight pounds of nuts in a year; which, when ripe, are cut down and laid in heaps to sweat for three or four days in the pods, then taken out, covered with plantain leaves, and so left to sweat a fortnight or three weeks longer. After this they are dried three or four weeks in the sun, and then become of a reddish colour.

This tree is difficult to cultivate, and a plantain is placed by every cacao-tree, because it delights in shade. They begin to bear at three, four, and five years old, and come to perfection in fifteen years; but frequently die before that time. They are, however, the most profitable trees in the world, for some of the Spaniards are said to make five thousand pounds sterling per annum, from one

arge plantation of cacaos; and an acre of them in Jamaica (from whence we receive more nuts, than from all the rest of our plantations) has cleared above two hundred pounds in a year. In some parts of America, the nuts are used by the natives as money, twelve or fourteen being esteemed equivalent to a Spanish real, or about seven-pence sterling.

But what renders the cacao-nut most famous is its being the principal ingredient in chocolate, a delicious substance first brought from America into Europe by the Spaniards about the beginning of the seventeenth century. Some dissolve this substance in water, others in milk, and others in wine; but water seems to be the best vehicle for it, as the most proper to distribute its nutritive parts, and to promote digestion. The composition of chocolate makes it chiefly proper for persons of cold constitutions, or old people, for those who have their strength impaired by repeated watchings, and for those who travel in cold mornings. As it is of an oily and tenacious nature, Dr. Cheyne, in his Essay on Health, thinks it should not be used by the weak and infirm, either as an aliment or a medicine; yet he grants that it may produce all the effects of a salutary food in vigorous and strong constitutions. It is confirmed by the experience of many physicians, that in hectic, scorbutic, and catarrhous disorders, chocolate is a wonderful remedy, having wrought a cure when all other means have proved ineffectual; And Hoffman affirms, that chocolate prepared with water, contributes much to the cure of melancholic disorders, arising from too weak and lax a state of the nerves, especially if we add to it a few drops of essence of amber. Dr. Stubbs, in the Philosophical Transactions, affirms, that

well-prepared chocolate is an excellent diet for those who are scorbutic, or afflicted with arthritic pains, and yet some of the best physicians have observed that drinking chocolate to excess contributes to the formation of stones, especially in the gall-bladder. It is agreed, however, that a man in perfect health may drink as much chocolate as he pleases, provided he finds himself refreshed, and his stomach not overloaded. In hot and sanguine constitutions the immoderate use of this liquor, by inspissating the blood and rendering it less fit for circulation, produces inflammations of the viscera, fevers and apoplexies. On account of the quantity of sugar that enters the composition of chocolate, it ought to be avoided by those who are subject to hypochondriac flatulencies ; and the disadvantages arising from the immoderate use of this drink, prepared with warm water, are plain to every one who reflects, that the frequent use of warm water relaxes the organs of digestion, and the solids in general, and must consequently prove pernicious.

The method of making chocolate, now used by the Spaniards in America, is first to dry the fruit in the sun, then to take out the kernels and roast them at the fire in an iron pan pierced full of holes, and afterwards grind them on a marble-stone, till they are brought to the consistence of a paste, mixing with them a quantity of sugar, some long pepper, and vanelloes, a little black seed, that gives the chocolate an agreeable flavour. Some add cinnamon, cloves, and anise, and even musk and ambergrise, if they love perfumes.—What is made in Spain differs something from that made in the West-Indies, two or three kinds of flowers being added, besides hazel-nuts and almonds ; and

they frequently work their paste with orange-water, which they think gives it a greater firmness and consistence. Sometimes the cakes are made up of the nut without any mixture, those that use it being left to add what quantity they please of sugar, cinnamon, &c. And this plain method is usually followed in England, except that sometimes sugar and sometimes vanellos are added, scarce any other ingredients being known amongst us.—It is said that in New Spain there is such a quantity of chocolate made as to use annually twelve million pounds of sugar.

Here is a species of canes or reeds remarkable for their length, their thickness, and the water contained in their tubes. They are usually between twelve and sixteen yards long ; and, though there is some difference in their size, the largest are not above six inches in diameter. The wood or side of the tube is about half an inch in thickness, so that, when the cane is split and opened, it is made to form a board near a foot and a half in breadth. From the time of their first appearance, till they attain their full perfection, many of the tubes contain a quantity of water : and, what is very remarkable, at full moon, they are very nearly full ; and with the decrease of the moon, the water ebbs. During the decrease, it appears turbid, and at the full is as clear as crystal. Yet the water is not found in all the joints, one having water, and others not, alternately. These canes, which are found, not only in South America, but in the West Indies, are an admirable proof of the indulgent care of Providence, by furnishing the traveller, in those hot countries, when fainting with heat, and at a distance from springs, or when they are dried up by the excessive heat, with a refresh-

ing draught, to quench his thirst. This water is also said to be an excellent preservative against the ill consequences of bruises, to which the traveller is also exposed ; and is therefore drank in South America by those who come from the mountains, where such accidents are in a manner unavoidable. These canes or reeds, being cut, are left to dry, whence they acquire such a degree of strength as to serve either for rafters, beams, flooring, or even masts for small vessels called balzas. They also serve as poles for litters, and for an infinite number of other uses.

The next plant we shall mention is the *be-juco*, a kind of woody cordage, of which there are two sorts ; one of which grows from the earth, and twines round the trees ; the other strikes its root into certain trees, and from thence derives its nourishment. Both kinds, after growing to a great height, incline again to the earth, on which they creep, till, meeting with another tree, they climb to the top of it, as before, and then again renew their inclination towards the earth ; and thus form a labyrinth of ligatures. Some are even seen extended like a cord, from the top of one tree to another. They are so extremely flexible, that no bending or twisting can break them. The slenderest of them are between a quarter and half an inch in diameter ; but the most common size, is a little above half an inch : there are, indeed others much thicker, but these are of little or no use, on account of the hardness contracted in their long growth. These may be justly considered as ropes formed by the hand of nature. They are chiefly used for lashing, tying, or fastening different things together ; and, by twisting several of them in the manner of our ropes, they are made to form

bridges, and even cables and hawsers for balzas and other vessels ; and are found by experience to last a long time in the water.

Another remarkable vegetable is the vijahua, which is also found in South America, and is a leaf generally five feet in length, and two and a half in breadth, growing wild, without any stem. The principal rib in the middle is nearly half an inch broad ; but all the other parts are perfectly soft and smooth. The under side is green, and the upper white, covered with a fine viscid down. It is commonly used for covering houses ; and also serves for packing up salt, fish, and other goods, sent to the mountains, to secure them from the rain.

ANIMALS.

AMERICA affords the curious naturalist a great variety of remarkable animals, and especially the Southern parts of it, where we find the man-tiger, described by Dr. Tyson as about the size of a mastiff dog, with a head fourteen inches long, and somewhat resembling that of a horse. It has large nostrils, and its nose is depressed lower than the upper jaw. It has a large tuft of hair on the forehead and under the chin ; and its fore-feet exactly resemble hands, having long and thick fingers and a thumb, the nails whereof are flat, but those of the hinder toes are not so. The fore part of its body, and the inside of its arms and legs are almost bare of hair, but the outside is covered with hair, which is of a

motley brown and olive colour. It has a navel and paps on the breast, feeds chiefly on fruit, and will sit and support itself by a stick in one hand, and drink out of a cup held in the other. It has two long tusks in the upper jaw, has no tail, and is a very fierce and lascivious animal.

The cuandu of Brasil, according to Dr. Tyson, is a sort of porcupine, described by Margrave and Nieuhoff, which has but four toes on the fore-feet and five on the hinder ones; so that, for want of what may be called the thumb, it is but slow in climbing trees; but has a way of twisting its tail about a bough, and thereby frequently saves itself from falling.—The tamandua, another animal of Brasil, has only four toes before, but five behind, and also makes use of its tail in climbing.

The eoati mondi of Brasil is represented variously by different writers, but is usually said to have a snout about a foot long, small eyes like a pig, round ears like a rat, and hands like those of a monkey. Its hair is short, rough, and of a blackish colour on the back, the rest of the body having a mixture of black and red. This animal is ranked by Dr. Tyson among the number of those he chooses rather to call four-handed than four-footed, of which some have no thumb on the fore-feet, and others none on the hinder ones. Of the former sort he reckons the vantrevan, which is a very beautiful creature, has a long tail, and is very brisk and nimble.

The sloth is a very remarkable animal; its body is short, its head small, and its fur long, thick, and of a greyish green; so that, when seen on the bough of a tree, it appears only like an excrescence or cluster of moss. It is about the size of a cat, but its legs and neck are short, and its long thick covering renders it so shapeless, that it seems only

an irregular lump of living matter. Its little head, which is remarkably ugly, stands between its shoulders. The face has some resemblance to that of a monkey, but its small heavy eyes are always half closed, and it has no external ears. Its feet are flat and very narrow, but armed with sharp claws for striking deep into the bark of trees.

This animal never changes its place but when compelled by necessity. As upon the ground it would be a prey to every other animal, its constant residence is on a tree, where it is safe from all animals, but those that climb the trees in quest of birds. Leaves and tender branches are its food, and serve it both for meat and drink. It never moves to another branch, till it has devoured all the nourishment upon that where it is stationed, nor from one to another till the first is wholly wasted. It is remarkable that the sloth always ascends to the top of a tree, only baiting as he goes, before he begins his devastations; for, was it to begin eating upwards, when it had devoured all, it would be half starved in climbing down from the top of a dead tree. But this is not all. The havock which one sloth makes on the largest tree, is easily seen, for he eats not only the leaves, but all the buds and bark, leaving only a dead branch; so that, unless the same thing might happen by accident, this would betray him. However, it does so happen, for trees always die at the top first, and so gradually downward. Thus this animal is wonderfully taught; as he feeds the tree decays; but its decay is in the course of nature. The decay spreads downward, and, when he has eaten the last of his provision, he is near the ground, and has only to walk to another tree; but if it be at any distance,

his motion is so slow, that he grows quite lean in the expedition.

As the female brings forth her young in the hollow of a tree, she is led by the same wonderful instinct to conduct them to the uppermost branches, as soon as they can crawl out. When she is pregnant, she climbs some old hollow tree, and having fixed on a convenient spot ascends to the very highest bough, and there feeds faster than usual. When she is full, she descends with unaccustomed haste, and brings forth one, two, or three young ones; which she is to support with her milk till they can crawl out, without having any supply herself. When she retires for this purpose, she is round and fleshy, but a mere skeleton when she comes out. She crawls however as well as she can, followed by her young, to the part where she left off feeding; nor will she feed by the way, however prompted by hunger and indolence.

The sloth is the most timid of all creatures, and with reason, for it can neither fight nor fly. While it is on its little journey on the ground, the tread of a human foot seems to strike it with terror: it trembles, the head is turned about every way, and the mouth is open to cry like a young kitten. Insignificant as this creature appears, says an ingenious author, there is a special providence visibly displayed in its form and preservation. Not designed for walking, its claws enable it to climb; helpless as it is, the universal Provider has assigned it a place of safety, where it finds plenty of food; and, as it cannot easily seek for drink, it has no need of any. To render it the less obnoxious to pursuit, its colour secures it even from view, and

its amazing instinct of feeding, from the top to the bottom of the tree, proves a designing and directing hand.

The opossum, which is a native of Brasil and other parts of America, is a very remarkable animal, in shape and size like a badger, but of a lighter colour, and with a longer tail. What is most wonderful, in this creature, is the bag or purse in the skin of its belly, to which its young ones retire and hide themselves in case of danger. In the male opossum however this pouch is not discernible, only the skin in that place, according to Dr. Tyson's observation, seemed to be looser, so that he could thrust it in with his finger, and by turning it round form a sort of bag, but, on withdrawing his finger, it returned to it's former position : and for this reason the doctor leaves it as an uncertain point, to be determined by those who live where these animals are bred, whether this part of the skin is capable of being formed upon occasion into a pouch, and whether they ever observe the male opossum to receive the young as the female does.

Perhaps the reader may not be displeased if we are a little more particular in our account of an animal so remarkable, which we shall chiefly take from the gentleman already cited, and Mr. Cowper, who have both published their anatomical observations on the opossum in the Philosophical Transactions. That which Dr. Tyson dissected, measured two feet seven inches from the extremity of the nose to the tip of the tail, the length of the head was six inches, that of the tail twelve, and the circumference of the body fifteen inches and a half when dead, but, when alive and well, it seemed much thicker. Its fore legs were six inches

long, the hinder ones only four and a half, and the tail near the root was three inches in compass. The apertures of the eye-lids were not horizontal, but lying in a straight line from the eyes to the nose. The ears were not sharp, but of a roundish figure, and about an inch and a half in length, which was almost the dimension of the mouth when opened, from one corner to the extremity of the nose. The hinder feet had four fingers armed with long crooked nails, and a perfect thumb, set off at a distance from the range of the other fingers, as in a human creature; and the fore feet had five long claws or fingers, equally ranged with each other, and a hooked nail at the end of each finger.

This formation of the legs, feet, and nails, seems very advantageous to the animal in climbing up trees, which it does very nimbly in pursuit of birds, a prey it is extremely fond of, though they do not constitute its only food. These fingers and claws are naked, and without hair, the skin being of a reddish colour. The palms, if dilated, are large, but so contrived as to be capable of contraction, which is likewise the case in its walking; and, that the palms might be the better defended from injury, at the setting on of each toe there is in the palms a protuberant, fleshy, and almost cartilaginous body. In feeding it makes use of its fore feet to bring the food to its mouth, like a monkey or squirrel. The tail is naked except for a little way near the root, from whence it tapers to the extremity, and is covered with a regular order of small whitish scales, which for the most part are of an oblong hexagonal figure. Between each there is observable a small skin or membrane, in which they are fixed, and which is of a darker

colour. The ears of this creature are without hair, and, though soft and slender, and in colour and substance almost resembling the wings of a bat, they are erect, and of an oval figure. The upper jaw is somewhat longer than the under, the eyes small, black, vivid, and exerted when alive, but very much sunk when dead: the neck is short, the breast broad, and it has whiskers like those of a cat. On the back and sides this animal is of an ash-colour, or dappled with black hairs in spots intermixed with white; but its belly is more of an amber colour.

Under the belly between the two hinder legs, is an aperture, about two inches long, but capable of greater extension, by dilating it with the fingers; and this the animal can so exactly close and contract, that the eye does not readily discern it. On each side of it there is a reduplication of the skin inwards, which forms a hairy bag, though the hairs are very thinly set, so that the skin is almost every where to be discovered. This is the bag or purse, already spoken of, which all authors agree is intended to preserve the animal's young, and secure them against danger; and the contrivance of nature in forming and adapting this part to that end is admirable, there being two strong bones, not to be met with in any other skeleton, which have no motion nearer or farther from each other, but stand always at an equal distance; and these bones are furnished with four pair of muscles, over which runs another pair, which perform the office of a pulley. In the male opossum, which Mr. Cowper dissected, the bag was not perceptible, nor the muscles belonging to it; but that gentleman, as well as Dr. Tyson, observed the bones just mentioned, and muscles running from

them to the hinder legs, which are undoubtedly serviceable to the creature in drawing up its body. This bag, the doctor found, is a membranous body, not very thick, though consisting of several coats, which perform the office of motion and secretion; for the cavity of the pouch is somewhat hairy, and our author observed the hairs matted together by a yellowish substance, which oozed out of the cutaneous glands. This liquor, discharged into the pouch from the glandulous coat, was of a strong smell, and had more of the peculiar foetor of the animal than any part besides; but, after the skin, together with the pouch, had been kept for some days, and was grown dry, there was so great an alteration in the smell, that what was before very disagreeable, now became a perfect perfume, exactly resembling the smell of musk. In this pouch most authors place the mammae or teats, but Dr. Tyson found none, nor even on the outward skin, as is usual in other multiparous animals; though he imagines that the opossum, which he dissected, might never have had a litter, and for that reason the teats might escape his notice.

The opossum, being a carnivorous animal, and particularly fond of birds, is endued by nature with a faculty of twisting its tail about a small branch of a tree, and thereby stretching itself out to rob a nest, or obtain its desired food: nay, by this means it may be said to fly; for hanging thus by the tail, and swinging its body too and fro, it can fling itself into a neighbouring tree, where its tail is sure to fasten on the first bough it meets with, if it otherwise misses its footing; and, its hinder feet being made like hands, and furnished with a thumb, it thereby the more readily raises its body.

We come now to an animal of such magnitude and strength, as, if not attested by authors of unquestionable veracity, we should not have ventured to describe. This is the condor of Peru, which Sir Hans Sloane (from the account of Captain Strong, commander of a South-Sea ship) has taken notice of in the Philosophical Transactions. This is an animal of the feathered race, and of such an amazing bigness, that the captain's men, who shot one and measured it, found it was sixteen feet from the extremity of one wing to the other. One of its feathers was two feet four inches long, the quill-part near six inches, its weight three drams and above seventeen grains, and was concave on one side and convex on the other. The seamen shot it as it sat on a cliff by the sea-side, and ate it, taking it for a species of turkey. They were told by the Spaniards that they were afraid of these birds, lest they should prey upon or injure their children.

To this account we may add the testimony of Acosta and Garcilasso de la Vega, who say that the fowls called condors by the Spaniards measure fifteen or sixteen feet from the end of one wing to the other; and that their beak is strong enough to tear off the hide or rip open the bowels of an ox. Two of them will attack a cow or bull, and devour him; and it has sometimes happened that one of them has assaulted and eaten boys of ten or twelve years of age. But it is observed, that nature, to temper and allay their fierceness, has denied them the talons which are given to the eagle, their feet being tipped with claws like a hen. They are black and white, like a magpye, and on the fore part of their head have a comb not pointed like that of a cock,

but rather even, in the form of a razor. It is very well, says our author, there are but few of them, otherwise they would commit great depredations among the cattle*.

De Ulloa observes, that the condor resembles in its colours and appearance the gallinazo, and sometimes soars from the highest mountains, so as to be almost out of sight. As it is seldom seen in low places, a subtle air seems best to agree with it; though some that have been tamed when young, live in the villages and plantations. They are carnivorous, and are frequently known to fly away with the lambs that feed on the heaths upon the sides of the mountains. This our author confirms from his own observation; for, seeing, on a hill adjoining to one on which he stood, a flock of sheep in great confusion, he perceived a condor flying upwards from them, with a lamb in its claws. When at some height he dropped it; but, following it, took it up, and let it fall a second time, and then winged his way out of sight, for fear of the Indians, who, at the cry of the boys and barking of the dogs, were running towards the place. This bird is frequently seen on the mountains; and, as it preys on the flocks, the Indians exert their utmost endeavours to catch it. One of these ways is killing an old cow, or some other beast, and rubbing the flesh with the juice

* Dr. Derham observes, that creatures less useful, or by their voracity pernicious, have commonly fewer young, or seldomer bring forth; of which many instances might be given in voracious beasts and birds, but there is one (says he) very peculiar, which is the condor of Peru, a most pernicious bird, and therefore very rare, being seldom seen, and only just enough of them to keep up the species, but not to overcharge the world.

off some potent herbs, which they afterwards carry away; otherwise the bird would not touch the flesh; and, to take off the smell, they bury the flesh till it becomes putrid, and then expose it; when the condors allured by the smell of the carcase fly to it, and feed greedily; till, the herbs operating, they become senseless and incapable of motion; when the Indians seizing the opportunity, destroy them. They likewise catch them with snares, laid near some flesh; but such is the strength of this bird, that sometimes, with the stroke of its wing, it knocks down the man who approaches it. Their wing also serves the condors as a shield, by which they ward off blows, without receiving any visible hurt.

The gallinazo is about the size of a pea-hen, but the head and neck are somewhat larger. From the crop to the base of the bill, it has, instead of feathers, a wrinkled, glandulous skin, covered with small warts and tubercles. Its feathers are black, as is also its skin: its bill is well proportioned, strong, and a little crooked. These birds are so numerous and tame, that, in the city of Carthagena, it is not uncommon to see the ridges of the houses covered with them; and they have so quick a scent, that they are said to smell a carcase at the distance of ten or twelve miles, and never leave it till they have entirely reduced it to a skeleton. Though their legs are strong and well-proportioned, they hop along on the ground, in a very awkward manner; for they have the toes forward, turning inwards, and one in the inside turning a little backwards; so that the feet interfere, which occasions their walking so badly. Each toe has long and thick claws. At their first issuing they fly heavily, but soon after dart out of

sight. These birds are of great service, on account of their picking up all kinds of filth, greedily devouring any dead animal, the eggs of the alligators, and whatever is most offensive: hence their multiplicity, in such hot climates, is a merciful dispensation of Providence, as otherwise the putrefaction, caused by the excessive heat, would render the air extremely insalubrious.

There is another species of these birds, somewhat larger than the former. In some of these, the head, and part of the neck, are white; in some red, and in others a mixture of both these colours. At a small distance from the crop, they have a ruff of white feathers, and are equally fierce and carnivorous with the former. These are called the kings of the gallinazoes, being few in number, and it being observed, that, when one of them has fastened on a dead beast, none of the other approach, till he has first eaten the eyes, which is generally the part he begins with first, and is gone to another place, when they all flock to the prey.

In Brasil we find a great number of curious birds, particularly the anhima, or unicorn bird, so called because it has a horn two or three inches long, growing out of his forehead, but blunt and brittle, and therefore of no defence to the creature.

One of the most extraordinary birds of South America, however, seems to be the tulcan or preacher, which is of the size of a pigeon, but has much longer legs; its tail is short, and its plumage dark, spotted with blue, purple, yellow, and other colours, that have a very beautiful effect. Its head greatly exceeds all proportion, with respect to its body; but this is necessary to enable it to support its bill, which is no less than six or

eight inches from the root to the point : the lower mandible closes with the upper through the whole length, and both diminish insensibly to the end, when it suddenly bends and terminates in a strong, sharp point. The tongue is formed like a feather and, as well as the inside of its mouth, is of a deep red. The bill is variegated with all the bright colours that adorn the plumage of other birds : at the base, and also at the convexity, it is generally of a light yellow, forming a kind of triband, half an inch broad ; and the rest is of a fine deep purple, except two streaks near the root, of a rich scarlet. The name of preacher, has been given to this bird, from its being accustomed to perch on the top of a tree, above the other birds, while they are asleep, and making a noise, like ill-articulated sounds, moving his head to the right and left, in order to keep off the birds of prey from seizing the others. They are easily rendered so tame, as to run about the house, and come when called. Their usual food is fruit ; but the tame eat other things, and, in general, whatever is given them.

Another bird of Brasil is called the cocoi, which is shaped much like our storks, and has a most curious variety of colours on its feathers.—The guará, which the Europeans call the sea-curlew, is surprising for its often changing its colour, being first black, then ash-coloured, next white, afterwards scarlet, and lastly crimson, which grows deeper and richer the longer the bird lives.

Parrots, parrokeets, and various birds of the same species are there as common as we have pigeons ; and though some of them are most beautifully feathered, they are in too great plenty to be esteemed by the natives, except now and then

to use their feathers as ornaments.—Of the eatable fowls they have turkies very large and delicious ; and the same may be said of their other kinds of poultry, especially a white sort of hens, whose feathers they dye of a fine green, and mix with those of other birds, which they wear about their heads and middle. They have likewise plenty of ducks and other water-fowl, but it is said the Brasilians will not eat them, thinking them infectious ; neither will they eat any kind of eggs, esteeming them unwholesome, if not poisonous ; and are surprised to see the Europeans eat them without injury.

Among the fishes that are frequently seen on the coast of Brasil, there is a remarkable one called the globe fish from its orbicular form ; and the sea hedge-hog, as being beset all round with large spikes like those of the land one, whereby it bids defiance to all fishes of prey, and has a surprising facility of moving itself forward on the water by the contraction and motion of those prickles.

But of all the animals in these seas, there seems to be none more curious than the sea-bladder, which has not been taken notice of by many authors. It is not inaptly stiled a bladder, being in most respects like one, and swimming on the surface of the waves. It is of an oblong roundish form, five or six inches in diameter, has a skin very thin and transparent, and, like a bubble raised on the water, reflects all the colours of the sky. The inside is only filled with air, except about a spoonful of water which serves to balance it ; and underneath it has a set of fibres of a vermicular form, which the creature extends or contracts, and thereby moves itself along. On its back it

has a kind of plaited membrane, which it likewise expands or folds up at pleasure, in order to take in more or less wind ; and it is only by these two last circumstances that these animals are known to move spontaneously, except when the wind is too strong for them to resist, by which they are frequently driven on shore and taken.

The remora, or sucking-fish, resembles a herring, with crest and fins, having a sucker about two inches long on the top of his head. The mouth is wide, and the eyes small, the under jaw longer than the upper, with two rows of small sharp teeth. This fish was much talked of amongst the ancients, who supposed (as appears from Pliny) that, by sticking to the side of a ship, it was able to stop the vessel under full sail, or a whale in swimming*. But as Mr. Catesby observes, a number of these fishes can do no more than shells, corals, and other things of the same bulk, which make a ship somewhat slower ; and in the same manner they may be some small hindrance to a whale.

Mr. Grose informs us, that these fish fasten upon the shark, by means of an oval-shaped membrane, of a texture admirably adapted to that purpose, with which they adhere so close to the skin of the shark, commonly on its sides or back, as not to part with it, even when it is taken ; and it is difficult to separate them by the utmost strength of the hands, if pulled against the grain of the sucker ; but, sliding them onward with the grain, they come off very easily ; and this force of adhesion continues while

* Hence they give it the name of remora, from remor, to stop or hinder.

there is any life in them, as may be proved on applying them to a table, or any hard substance. They annoy the shark in the nature of vermin, drawing their sustenance from the slimy oozing of its body, while it can neither shake them off, nor destroy them.

To this we may add the pilot fish, which is seldom above a foot or eighteen inches long, but is extremely beautiful, being streaked transversely, with blue and a yellowish brown that have a very pleasing effect on the water, but lose much of their lively gloss when taken out of it. These fish, says Mr. Grose, are often seen in small shoals, swimming immediately a-head of the shark, or near him. When a bait is thrown out for the shark, they cluster about it, without attempting to nibble it; but by their motions to and fro, seem to guide the shark towards it; from whence they obtain the name of pilot-fish; when in company with the shark, they seldom take the small hook; but when they have lost this companion, or follow a ship, either singly, or in shoals, they sometimes bite and are caught. They are esteemed, for their size, the most delicious eating the ocean affords, and have nothing of that dryness attributed to many other sorts of fish.

In the seas of South America, and especially about the tropics, are often seen swimming in shoals those fishes we call old wives* and old husbands, which indeed make a very remarkable figure. The former is commonly about ten inches long, and five in breadth; has a very small mouth, with sharp teeth, a large eye placed high

* Pascoe Thomas says they found plenty of these fish (amongst others that he mentions) at the island of St. Catherine's, on the coast of Brasil.

on the head, two nostrils or vent-holes under the fore part of the eye, a rising sharp back, the belly flattish, and the whole fish is covered with a hard crustaceous skin, of a brown colour, but curiously marked with indented spots, which are large on the sides, and smaller about the head and tail. The tail is long and slender, and the fish can draw it into its body at pleasure, as it were into a socket. It has four fins of a lighter brown than the body, as is also the end of the tail.

The old husband, supposed to be the male species, seems designed by nature for the defence of the female, as well as his own, being armed with two sharp horns on the fore part of his head, growing from a thick basis, about three quarters of an inch in length; and though but slender, they are so strong, that he is capable of giving dangerous wounds to an enemy. His hinder part is likewise well guarded with two long fins like his horns, one on each side of the belly near the tail; and when closely chased, he draws up his tail, and bids defiance with his horns to his pursuers. These two fishes swim together in company, and, except the horns, they bear a near resemblance to each other.

But we must return to the land, where we shall find some remarkable animals not yet mentioned; and first it may not be improper to take notice of what some travellers relate concerning the various kinds of monkeys to be met with in the Andes and other parts of South America. Some of them are said to be merry, others melancholy; some nimble, and others heavy; some hairy, others almost naked; of themselves timorous, but taking courage if a man seems to be afraid.

Almost all the woods and forests of South America are filled with different kinds of these animals, of various colours, as black, brown, and inclining to red ; there is also the same diversity in their size, some being a yard long, others half a yard, and others scarcely a foot. Their different species skipping in troops from tree to tree, hanging from the branches, and playing a thousand gambols, and, in other places, six, eight or more of them linked together in order to pass a river, with the dams, carrying their young on their shoulders, or throwing themselves into the oddest gestures, must appear fictitious to those who have not actually seen them. The flesh of all these different kinds is highly valued by the Negroes, especially that of the red ; but, however delicate the meat may be, says our author, the sight of them is enough to make the stomach abhor them ; for, being scalded when dead, in order to take off the hair, the skin is contracted by the heat, and, when thoroughly cleaned, looks perfectly white, and nearly resembles a child of about two or three years of age, yet the scarcity of food, in many parts of America, renders their flesh valuable ; and not only the Negroes, but the Creoles, and even the Europeans themselves, eat them without scruple. It is highly probable that most of those people who have been stigmatised by the first discoverers with the name of Cannibals, obtained it on account of their eating these animals, which when thus dressed, were mistaken for children, and the larger kind for men and women. Indeed, there can be no doubt of this being the case, since most of the nations, who have been charged with living upon human flesh, have been found, upon a better acquaintance with

them, to be of a mild and benevolent disposition, ready to grant their aid to all who wanted their assistance; unless it be supposed that the first discoverers, merely from a spirit of malevolence, represented them in such odious colours, in order to give a sanction to their cruelties, and to have a plausible pretence for plundering and murdering those who had never injured them.

Alligators are very common, both in South America and the West-Indies, but they seem to abound no-where in greater abundance than on the river Guayaquil, in Peru. These amphibious animals, that live both in the rivers and adjacent plains, when tired with fishing, leave the water, and bask in the sun, and then appear rather like rotten wood, thrown ashore by the current, than living creatures; but, upon perceiving any vessel near them, they immediately throw themselves into the water. They are the largest animals of the lizard kind, some of them being of so monstrous a size as to exceed fifteen feet in length.

The head of the alligator is long, turning up at the nose, like the snout of a hog, and furnished with two rows of strong pointed teeth. His eyes are large, round, clear, and grey, with a black pupil. The fore legs are shorter and weaker than those behind, and have five toes, three of which are armed with nails, but the two others are without. The hinder feet are larger and thicker, and have only four toes. Over the eyes are two hard, scaly knobs, as big as a man's fist; and, from the head to the tail, are a multitude of hard knotty scales, which are impenetrable to a musket-ball. The flesh smells very strong of musk, especially four kernels, two placed in the groin, near the thigh, and the other two at the

breast, one under each fore leg, about the size of a pullet's egg. During the time they lie basking on the shore, their huge mouths are wide open, till filled with musketoes, flies, and other insects; when, suddenly shutting their jaws, they swallow their prey. They generally avoid a man, and on the approach of any one, plunge into the water. The female makes a large hole in the sand, near the brink of a river, and there deposits her eggs, which are almost as large as those of an ostrich, and as white as those of a hen, but much more solid. She generally lays about a hundred, continuing in the same place till they are all deposited, which is about a day or two. She not only covers them with sand; but, the better to conceal them, rolls herself over them, to a considerable distance, and then returns to the water, till natural instinct informs her that it is time to deliver her young from their confinement. When she comes to the spot, she is followed by the male; she then tears up the sand, and begins breaking the eggs, with such care, that scarcely a single one is injured, and a whole swarm of little alligators are seen crawling about. She then takes them on her neck and back, to remove them into the water; but the watchful gallinazos seize this opportunity to deprive her of some; and even the male alligator devours what he can, till the female has reached the water with the few remaining; and then all that fall from her back, and do not swim, she herself eats; whence, of this formidable brood, happily no more than four or five escape.

The gallinazos, of which we have just given a description, contribute greatly to prevent their increase; for being extremely fond of their eggs,

they, upon this occasion, make use of extraordinary address, and often make it their sole business to watch the females during the dry season, when they lay their eggs, the sides of the river not being then covered with water. The gallinazo keeps itself concealed among the branches of some tree, till the alligator has laid her eggs and is retired; but she is no sooner under the water, than the gallinazo darts down on the repository, and, with its beak, claws, and wings, hars up the sand, and devours the eggs, leaving only the shells. This banquet would richly reward its long patience, did not a multitude of gallinazos, from all parts, join the fortunate discoverer, and take a share in the spoil. These eggs, when fresh, are also eaten by the mulattoes. Thus Providence graciously diminishes the number of these destructive animals, which would soon increase so fast, that neither the river nor the neighbouring fields, would be able to contain them.

These destructive animals use great address in catching fish, which is their principal food: eight or ten, as if by agreement, drawing up at the mouth of a creek or river, while others go a considerable distance up, and chase the fish downwards; by which means none of a large size are able to escape them. The alligators, being unable to eat under water, on seizing a fish, raise their head above the surface, and, after satisfying their appetite, lay themselves on the banks. When they cannot find fish, they betake themselves to the meadows near a river, and devour its and calves. This is done in the night, in order to surprise them in their sleep; and it is observable that those which have once tasted

flesh, become so fond of it, as never to feed upon fish, but in cases of necessity. There are, indeed, many melancholy instances of their devouring the human species, especially children, who have been out of doors in the dark; and, having once seized them in their mouths, they make sure of their prey, against that assistance which the cries of the victim constantly bring, by hastening into the water, where they immediately drown it, and then, rising to the surface, devour it at leisure. The boatmen, by inconsiderately sleeping, with one of their arms or legs over the side of a boat, have been seized by these animals, and the whole body drawn into the water. Those alligators, who have once feasted on human flesh, are known to be most dangerous, and are said to entertain an insatiable desire of repeating the same repast. Hence the inhabitants of the places where they abound, are very industrious in destroying them. For this purpose, they usually take a piece of hard wood, sharpened at both ends; this they fasten in the middle to a thong, the end of which is secured on the shore, and then bait the wood with the lights of some animal. The alligator, on seeing the lights floating on the water, snaps at the bait, and, both points of the wood entering his jaws, he is dragged on shore, with his mouth wide open. He then endeavours, with all his might, to rescue himself, while the Indians bait him, knowing the greatest damage he can do them is to throw down those, who, for want of agility or care, do not keep out of his reach.

Brasil is remarkable for large serpents and other venomous creatures. There is one called ibaboca, which is between three and four yards

long, and of a considerable thickness. Its colours are various, as black, white, red, green, &c. and its bite mortal, but the poison works very slowly. Some of the scorpions are four or five feet long, but their sting is not reckoned so dangerous as those in Europe. Here also are lizards three or four feet in length, and in great numbers.

One of the most common snakes in the government of Carthagena, is the coral-snake, which is generally between four and five feet in length, and about an inch in diameter. Its appearance is very beautiful, the skin being variegated with green, yellow, and a vivid crimson. The head is long and flat like a viper; and each mandible furnished with a row of pointed teeth; through which, during the bite, it insinuates the poison, which is most dreadfully malignant; the person bitten swelling to such a degree, that the blood gushes out through all the organs of sense, and even the coats of the veins, at the extremities of the fingers, burst.

The willow-snake resembles, in colour and form, a stick of that tree. It is very common in South America; and as it frequently hangs from the boughs, it really seems to be a part of the tree, till a too near approach discovers the mistake. Though its poison is less active than that of the coral-snake, its bite proves mortal, unless a remedy be speedily applied.

The centipede or scolopendra, which received the first of these names from the great number of its feet, grows to a monstrous size at Carthagena; and is more dangerous from its breeding in the houses. It is generally a yard in length, and about five inches in breadth: the back and

sides are covered with hard scales of a brown colour, tinged with red ; but so articulated as not in the least to impede the animal's motion, and yet so strong as to defend it against any blow ; so that it can only be killed by a blow on the head. These creatures are very nimble, and their bite, without timely application, proves mortal.

After mentioning these reptiles, it will be proper to take notice of an insect, called *coyba*, which is extremely remarkable for the venom it contains. In shape it resembles a spider, but is much less than a bug. Its colour is of a fiery red, and, like the spider, is usually found in the corners of walls, and among the herbage of the meadows. Its venom is so extremely malignant, that on squeezing the insect, if any of it happen to fall on the skin, either of man or beast, it instantly penetrates the flesh, and produces large tumours, that are soon succeeded by death. The only remedy hitherto known is, on the first appearance of a swelling, to singe the party all over the body, with flaming straw, or long grass. For this purpose, the native Indians lay hold of the patient, some by the feet, and others by the hands, and with great dexterity perform the operation ; after which the person is thought to be out of danger.

Though this insect is so very noxious, yet squeezing it between the palms of the hands is attended with no ill consequence, the callus preventing the venom reaching the blood ; accordingly the Indian muleteers, in order to gratify the curiosity of passengers, squeeze them between the palms of their hands ; but should a person unused to labour make that experiment,

the effect would probably be nearly the same, as in any other part of the body. The people who travel along the valleys of Neyba, and others within the jurisdiction of Popayan, where they are in great danger from these coybas, are warned by the Indians who attend them, that, if they feel any thing stinging or crawling on their neck or face, to take care not to scratch, nor even to lift up their hand to it, the coyba being of so delicate a texture, that it would instantly burst; and as there is no danger, while they do not eject the humour they contain, the person acquaints some of the company with what he feels, and points to the place, where, if it be a coyba, the other follows it away. It is remarkable, that the beasts, who are incapable of such warning, are by instinct, taught a precaution against the danger; for, before they offer to touch the herbage with their lips, they blow on it with all their force, in order to disperse any of those pernicious vermin; and when their smell acquaints them, that they are near a nest of coybas, they immediately leap, and run to some other part; but sometimes a mule after all his blowing, has been known to take in some with his pasture; on which, after swelling to a frightful degree, he has expired on the spot.

ANTIQUITIES.

THE reader will not expect any thing very extraordinary under this head, in a part of the world whose inhabitants have been generally supposed unpolished and barbarous: but, as the

incas of Peru are famous in history, it may not be amiss to give a short account of some of the noble structures which the Spaniards found when they first invaded their country. At that time Cusco was the capital of the kingdom, and there was a castle built in such a surprising manner that many people, who saw it, imagined it could not have been raised without the assistance of enchantment. This fortress stood on the top of a hill, and on the edge of a precipice, which towards the town was perfectly perpendicular. Towards the country it was defended by triple semicircular walls, of such height and thickness, that they were proof against all the force that could be brought against them. Some of the stones, were of such a prodigious size, that it was inconceivable how they were hewn out of the quarry, or brought to the place, the natives having no iron tools, no beasts to draw them, nor engines to raise them to such a height. They were dragged, however, by the strength of men, twelve, or fifteen leagues, over hills and valleys, and along the most difficult roads; and there is one stone in particular, to which the Indians give the name of *Syacusa* or "the Weary," because it never arrived at the place for which it was designed. This rock is said to have been drawn fifteen leagues by twenty thousand Indians, over very rugged and uneven roads; but, notwithstanding all their care and strength, it got the better of them, and tumbling down the hill killed several hundred men, who were endeavouring to poise the weight. They raised it, however, once again, and with incredible pains dragged it to the plain in the neighbourhood of Cusco, where they were obliged to leave it, being un-

ble to get it up the hill on which the castle was situated.

Between each wall of the castle there was a space of twenty-five or thirty feet, which was filled up with earth, and every wall had a breast-work on the top of it. Beyond these walls were three large towers, standing in a triangle, answerable to the bending of the walls. The principal of these towers had a fountain of excellent water, brought to it by a subterraneous aqueduct, the source of which was only known to the Inca and his council, lest an enemy should discover the stream, and cut it off in case of a siege. This tower was round, and in it the Inca had an apartment, nobly furnished like the rest of his palaces. The other two were square, and contained rooms for the garrison, who were all of the royal blood. Underneath these towers were apartments as large as those above; and they had a communication with each other, by a subterraneous labyrinth, through which it was difficult for a stranger to find his way without a guide. It is said that great part of the new city of Cusco was built with the stones found in the ruins of this fortress.

The palaces of the Incas in Cusco, besides the castle just mentioned, were very spacious and magnificent, some of the halls being two hundred paces in length, and fifty or sixty in breadth; inasmuch that the Spaniards converted one of them into a cathedral church. The stones of these buildings were so well joined together that they needed no cement; but sometimes, for the sake of ornament, they closed up the seams of their structures with melted gold and silver, which occasioned the total destruction of most of them, the Spaniards subverting the very foundations in

hopes of finding treasure. Most of the apartments were decorated with figures of men, beasts, birds, and other animals, cast in gold; and on the walls, instead of tapestry, were plants and flowers of the same metal, intermixed with serpents, butterflies, and other reptiles and insects. It seems there were no chairs in these palaces, but the inca himself sat on a stool made of gold, without arms or back, having a pedestal of the same metal. They had also cisterns of gold in their bagnios, and the utensils of their kitchens, and in the meanest offices, were likewise of gold; but they neither purchased houses nor lands with this metal, as we do; but used it as an ornament when living, and buried it with them when they died. The royal gardens were not only planted with great variety of trees, flowers, &c. but the figures of those and all sorts of animals were made of gold, and placed in the walks to adorn them. These magnificent palaces, however, were greatly inferior to the temple of the Sun, which was enriched with the greatest treasures that ever the world beheld. It was built of free-stone, and lined with gold, the cieling being also of the same metal, though the roof itself was no better than common thatch. It was divided into several cloysters, or apartments; in the principal whereof, towards the east, was placed the image of the Sun, consisting of one gold plate that covered the whole breadth of the chapel, and twice as thick as the plates that covered the other walls. This image was of a circular form, representing the Sun with his rays darting from him, much in the same manner as he is drawn by European painters; and on each side of it were placed the bodies of the deceased incas, so embalmed that

They seemed to be alive. These were placed on thrones of gold, but on the arrival of the Spaniards they were concealed by the Indians, with most of the treasures of the temple.

This temple had several gates covered with gold; and round the top of it, on the outside, was a cornice three feet deep, consisting of gold plate. Besides the chapel of the Sun, there were five others of a pyramidal form, the first of which was dedicated to the Moon, deemed the Sister and Wife of the Sun; and the doors and walls of this structure were covered with silver. Here was the image of the Moon, of a round form, with a woman's face in the middle of it; and on each side of the image were placed the bodies of the deceased empresses ranged in order. Next to this chapel was that of Venus, by the Peruvians called Chasea, who was much esteemed as an attendant on the Sun, as the rest of the stars were deemed maidens of honour to the Moon; and this chapel was likewise plated with silver. The third chapel was dedicated to thunder and lightning, which they looked upon as servants of the Sun; and this was cieled and wainscoted with plates of gold. The fourth was dedicated to the rainbow, as owing its origin to the Sun; and this was also covered with gold, and had on one side of it a representation of the rainbow. The fifth chapel was an apartment for the use of the high-priest, and others who officiated in the temple, who were all of the royal blood; and this, like the chapel of the Sun, was adorned with gold.

There was no other image worshipped in the temple but that of the Sun, but there were numerous figures of men, women, and children, and of various birds, beasts, and other animals of wrought

gold, placed in it for ornament ; and all the vessels and utensils were of the same precious metal. We likewise read of a sort of nunnery wherein were kept a thousand or fifteen hundred virgins, all of the blood of the emperors, who were intended only for the service of the temple. Nor was it only in the city of Cusco that a temple was erected, but almost every large town in the country had one adorned in the like sumptuous manner.

BUILDINGS.

LIMA, the chief town of Peru, is seated in a large fertile plain near the sea, and is surrounded by brick walls, fortified with several ramparts and bastions twenty-four feet high. The houses in general are only one story high as they have so frequently suffered from earthquakes ; but what they want in height they make up in length and breadth ; for many of them are two hundred feet long, and proportionably broad, so that they have ten or twelve large apartments on the ground floor. The roofs, for the most part, are covered with reeds and coarse linen ; but those of the grandest houses are covered with fine mats, or beautiful cotton cloths. Most of the houses are also adorned with long galleries in front, and are agreeably shaded by handsome rows of trees.

The royal square is very handsome, and in the middle is a fountain of bronze, with an image of Fame spouting up water. All the churches and convents are extremely rich, and many images of the saints are of massy gold adorned with jewels.—From the river which crosses Lima, there are

canals which run to most of the houses, and serve to water the gardens.

Carthagena is situated on a sandy island, which, forming a narrow passage on the south-west, opens a communication with Tierra Bomba. The land is so narrow on the north side, that originally the distance from sea to sea was only thirty-five fathoms ; but afterwards enlarging, it forms another island on this side, and the whole city, excepting these two places, is entirely surrounded by the sea.

The city and suburbs of Carthagena are well laid out, the streets being straight, broad, and well paved. The houses in general are built of stone, and the apartments are well contrived ; but the balconies and lattices are all of wood, as being more durable in this climate than iron, which is soon corroded and destroyed by the moisture and tempestuous quality of the nitrous air.—The churches and monasteries are large and handsome structures ; but there appears somewhat of poverty in the ornaments, and some of them want what even decency requires.

It is particularly worthy of observation, that the walls of Lima, although built on the surface of the earth, without any foundation, have withstood those tremendous earthquakes which overthrew the most solid fabrics. This peculiarity is likewise found in the walls of other towns throughout the main.

Buenos Ayres stands on a point called Cape Sanco on the south side of the Plata, in a fine plain, rising with a gentle ascent from the river. The streets are straight, broad, and uniform ; and there is one very handsome square, one side of which is formed by the governor's castle. Most of

the buildings are of chalk or brick, except the cathedral, which is a magnificent structure, composed chiefly of stone.

The town of St. Philip de Porto Bello stands near the sea, on the declivity of a mountain surrounding the whole harbour. Many of the houses are built with wood, but in some the first story is of stone, and the remainder of wood : they are about one hundred and thirty in number, and most of them are very large and spacious. At the east end of the town is a quarter called Guinea ; because there all the negroes, whether slaves or free, have their habitations. This quarter is much crowded when the galleons are in the harbour, most of the inhabitants of the town entirely quitting their houses at that season for the advantage of letting them.

The harbour of Porto Bello is extremely commodious for all sorts of vessels, and though its entrance is very wide, it is well defended by Fort St. Philip de todo Fierro. It stands on the north point of the entrance, which is about six hundred fathoms broad ; but the south side being full of ridges of rocks, extending to some distance from the shore, a ship is obliged to stand to the north, through the deepest part of the channel, which lies in the middle of the entrance, and thus continues in a straight direction.

On the south side of the harbour, and opposite to the anchoring place, is a large castle called Santa Jago de la Gloria ; to the east of which, at the distance of a hundred fathoms, begins the town, having before it a point of land projecting into the harbour.

Guiaquil is a city of considerable extent, taking up, along the banks of the river, from the

lower part of the old town to the upper part of the new, a space of near half a league; but the breadth is not at all proportional, every person being fond of having a house near the river. All the houses of both towns are built of wood, and rarely of them covered with tiles; though the greatest part of those in the old town are only thatched: but in order to prevent the spreading of fires, by which this city has severely suffered on several occasions, such covering is now prohibited, and as a farther precaution against fire, which they have so much reason to dread, the kitchens stand twelve or fifteen paces from the houses; with which they communicate by means of a long open gallery, resembling a bridge; but so slightly built, that, on the least appearance of fire in the kitchen, it may be demolished in an instant, by which means the house is preserved.

The ground on which the new city is built, and the savannas in its neighbourhood, are not to be travelled over either on foot or horseback during the winter; for being a spungy chalk, it is every where so level, that there is no declivity for carrying off the water: and therefore on the first rain it becomes a general slough. In this respect the old town has the advantage, being built on a gravelly soil, which is never impassable. This city is defended by three forts; two on the river near the city, and the third behind it, guarding the entrance of a ravin. These are all built after the modern method of fortification, but before they were erected, it had only a platform, which is still remaining in the old town. All the churches and convents are of wood, except that of St. Domingo, still standing in the old town, which is of stone; the great solidity of the

ground in that part being sufficient for supporting buildings of this kind.

The city and its jurisdiction are under a corregidor, nominated by the king, who holds his office during five years. Notwithstanding he is subordinate to the president and audience of Quito, he appoints the deputies in the several departments of his jurisdiction, both for the police and civil government. Guiaquil contains, in proportion to its dimensions, as many inhabitants as any city in all America; the continual resort of strangers drawn thither by commerce, contributing very greatly to increase the number, generally computed at twenty thousand.

The city of Quito stands in the inland part of the continent of South America, and on the eastern skirts of the West Cordillera of the Andes. Its distance from the coast of the South Sea is about thirty-five leagues west. Contiguous to it, on the north-west, are the mountains of Pichincha, not less famous among strangers for their great height, than among the natives for the great riches they are imagined to contain. The city is built on the acclivity of that mountain, and surrounded by others of a middle height, among the breaches, or guaycos, as they are called here, which form the eminences of Pichincha. Some of these breaches are of a considerable depth, and run quite through it, so that great part of the buildings stand upon arches. This renders the streets irregular, and extremely uneven, some parts of the city being built on the ascents, descents, and summits of the breaches. The city, with regard to magnitude, may be compared to one of the second order in Europe.

but the unevenness of its situation is a great disadvantage to its appearance.

Near it are two spacious plains : both of which are interspersed with seats and cultivated lands, which greatly add to the prospect from the city, being continually covered with a lively verdure. These two plains contract as they approach the city ; and at their junction, form a neck of land, covered with those eminences, on which part of Quito stands. It may, perhaps, appear strange, that notwithstanding two such beautiful and extensive plains are so near the city, a situation so very inconvenient should be preferred to either. But the first founders seem to have had less regard for convenience and beauty; than for preserving the remembrance of their conquests, by building on the site of the ancient capital of the Indians, who made choice of such places for erecting their towns ; probably from their being better adapted for defence. Besides, the Spaniards, during the infancy of their conquest, little imagined this place would ever increase to its present magnitude. Quito, however, was formerly in a much more flourishing condition than at present.

The principal square in Quito has four sides, in one of which stands the cathedral, and in the opposite one the episcopal palace ; the third side is taken up by the town house ; and the fourth by the palace of the audience. It is very spacious, and has in the centre an elegant fountain. It is, indeed, rather disfigured than adorned by the palace of the audience ; which, instead of being kept in repair, has been suffered to fall into ruins ; only a few halls and offices being taken any care

of. The principal streets are paved; but those which are not, are almost impassable after rain, which is here very common.

Besides the principal square, there are two others in Quito, and both very spacious, together with several others that are smaller. In these the greatest part of the convents are situated, and thence make a very handsome appearance; the fronts and portals of those edifices, dedicated to religion, being adorned with all the embellishments of architecture, particularly the convent of the Franciscans, which being wholly of free stone, must have cost an immense sum. The cathedral, besides the richness of its furniture, is splendidly adorned with tapestry hangings, and other costly decorations.

Among the courts, whose sessions are held at Quito, the principal is that of the royal audience, instituted in 1563, and consists of a president, four auditors, and a royal fiscal, and persons in other high official situations in the province. There is, likewise, another fiscal, called protector de los Indios, who solicits for the Indians; and occasionally pleads in their defence. The jurisdiction of this court extends to the utmost limits of the province, and from its decisions lies no other appeal than to the council of the Indies.

Here are also established a tribunal de cruzada; a treasury for the effects of persons deceased, a very excellent institution, though frequently abused; and a court of inquisition, under a commissary and familiars appointed by the holy office of Lima.

The cathedral chapter consists of the bishop, dean, and other dignitaries, who enjoy considerable revenues. This chapter was erected into a

ceathedral in 1545, and among other festivals celebrated in it with extraordinary magnificence; rare those of Corpus Christi, and the Conception of our Lady; at which all persons of eminence assist.

Panama is built on an isthmus of the same name, the coast of which is washed by the South Sea. The houses in general are of wood, of one story, and a tiled roof, but large; and their disposition, and the symmetry of their windows, make a handsome appearance: a few however are of stone. The streets, both of the city and suburbs, are straight, broad, and for the most part paved.

In this city is a tribunal, or royal audience, in which the governer of Panama presides; and to this employmet is annexed the captain-ship-general of Terra Firma, which is generally conferred on an officer of distinction, though his common title is that of President of Panama: it is a bishopric, and has also a court of inquisition appointed by the tribunal of inquisition at Cartagena.

The harbour of this city is formed in its road, by the shelter of several islands, particularly Isla de Naos, de Perico, and Flamencos; and the anchoring place is before the second, and thence called Perico. The ships here lie very safe, and their distance from the city is about two leagues and a half, or three leagues.

The harbour of Perico is the rendezvous of the Peru fleet, during the time of the fair; and is never without barks loaded with provisions from the ports of Peru, and a great number of coasting vessels going from thence to Choco, and parts on the western coast of that kingdom.

The principal and most common materials used in building on the Guiaquil and other rivers of South America, are canes; which also form the inward parts, as walls, floors, and rails of the stairs. The larger houses differ only in some of the principal pieces, which are of wood. The method of building is, to fix in the earth eight, ten, or twelve pieces of wood, more or less, according to the dimensions of the house, forked at the top, and of a proper length; all the apartments being on the first story, without any ground floor. Beams are then laid across on these forks, at the distance of four or five yards from the ground. On these beams, canes are laid in such a manner as to form a kind of rafters; and over these, boards, of the same canes, a foot and a half in breadth, which form as firm and handsome a flooring as if of wood. The partitions of the several apartments are of the same materials; but the outer walls are generally latticed, for the free admission of air. The principal beams of the roof of large houses are of timber, the rafters of cane, with smaller ones in a transverse direction, and over these vijaua leaves. Thus a house is built with very little expence, though containing all the necessary conveniences. With regard to the poorer sort, every one's own labour serves to procure him a habitation. The lower part of both of these houses, are entirely open, without having any fence, except the posts and stanchions by which the building is supported. The ground floor is wholly useless in the winter, when all the country is turned to mud. Such houses, however, as stand beyond the reach of inundations, have ground floors furnished like the other apartments.

All the inhabitants have their canoes for passing

from one house to another ; and are so dexterous in the management of these skiffs, that a little girl ventures alone in a boat so small and slight, that another less skilful would overset in stepping into it.

The continual rains in winter, and the slightness of the materials with which these houses are built, render it necessary to repair them during the summer ; but those of the poorer sort, which are low, must be rebuilt every year.

The vessels used upon the Guiaquil are chatas, canoes, and balzas, or rafts, a name which sufficiently explains their construction, but not the method of managing them ; which these Indians, strangers to arts and sciences, have learned from necessity.

The balzas, called by the Indians jangadas, are composed of five, seven, or nine beams, of a sort of wood, which, though known here only by the name of balza, the Indians of Darien call puero ; and, in all appearance, is the ferula of the Latins, mentioned by Collumella. It is a whitish, soft wood ; and so very light, that a boy can easily carry a log of it, three or four yards in length, and a foot in diameter.

Balzas are not only used on rivers, but small voyages are made at sea on them ; and sometimes they go as far as Paita. Their dimensions being different, they are also applied to different uses ; some of them being fishing balzas ; some carry all sorts of goods from the custom-house to Guiaquil, and from thence to Puna, the Salto de Tumbez, and Paita ; and others, of a more curious and elegant construction, serve for removing families to their estates and country houses, having the same convenience as on shore, not being in the least agi-

tated on the river ; and that they have sufficient room for accommodations, may be inferred from the length of their beams, which are twelve or fifteen fathoms, and about two feet, or two and a half diameter ; so that the nine beams, of which they consist, form a breadth of between twenty and twenty-four feet, and proportional in those of seven, or any other number of beams.

The thickest beam of those which compose the balza, is placed so as to project beyond the other in its after parts, and to this is lashed the first beams on each side, and thus successively till the whole are secured ; that in the middle being the principal piece, and thence the number of beams is always odd. The larger sort of balzas generally carry between four and five hundred quintals, without being damaged by the water ; for the waves of the sea never run over the balza, neither does the water splash up between the beams, the balza always yielding to the motion of the waves.

But the greatest singularity of this floating vehicle is, that it sails, tacks, and works as well, in contrary winds; as ships with a keel, and makes very little lee-way. This advantage it derives from another method of steering than by a rudder ; namely, by some boards, three or four yards in length, and half a yard in breadth, called gueras, which are placed vertically both in the head and stern, between the main beams, and by thrusting some of these deep in the water, and raising others, they bear away, tack, lay to, and perform all the other motions of a regular ship.

CUSTOMS, MANNERS, AND GOVERNMENT OF
THE INHABITANTS OF SOUTH AMERICA.

THE inhabitants of Lima consist of Spaniards, Indians, Negroes, Mestizos, and a variety of other castes, proceeding from the mixture of all three. The Spaniards, who make the greatest figure, have a multitude of slaves and other domestics, and keep coaches; while others are satisfied with having a chaise, no family of any substance being without one. These carriages are drawn by a mule guided by a driver, and have only two wheels, with seats opposite to each other; they are very light and airy, and, on account of their carving and gilding, sometimes cost eight hundred or a thousand crowns. There are said to be no less than five or six thousand of these vehicles kept in the city of Lima. The Negroes, Mulattoes, and their descendants, form the principal part of the inhabitants of that city; and of these are most of the mechanics. The Europeans also follow the same employments, for, the desire of gain being here the universal passion, the inhabitants pursue it by all possible means.

The dress of the men, in general, is little different from that worn in Spain: nor is there much distinction between the several classes, every person being allowed to wear whatever he can purchase; so that a mulatto, or any other mechanic, is frequently seen dressed in rich tissue. All the people at Lima are fond of fine clothes, and extremely lavish in this article; but the dress of the men is greatly exceeded by that of the women, who, in the choice of their laces, carry their taste to an amazing excess; and this has spread

through all ranks, except the lowest class of Negroes, so that no woman of rank will wear any that is not made in Flanders. The dress of the ladies consists of a pair of shoes, stockings, a shift, a dimity petticoat, and a jacket ; which in summer is of linen, and in winter of a beautiful stuff. From the under petticoat, which only reaches to the calf of the leg, hangs a border of very fine lace, through which the ends of the garters are discovered, embroidered with gold or silver, and sometimes adorned with pearls. The upper petticoat, which is of velvet, or some rich stuff, is fringed all round, and covered with lace or embroidery. The shift-sleeves, which are a yard and a half in length, and two yards wide, when worn for ornament, are covered with lace, so as to render the whole truly elegant. Over the shift is worn a jacket, with large circular sleeves, consisting of rows of lace, or slips of cambric, with lace disposed between each. The body of the jacket is tied on the shoulders, with ribands fastened to the back of the stays ; and its round sleeves, being tucked up to the shoulders, form, with those of the shift, what may be termed four wings. In summer they have a kind of veil of the finest cambric or lawn, richly laced ; but, in winter, the veil worn in their houses is of baize, which, when they go abroad full dressed, is adorned like the sleeves. Over the petticoat is an apron of the same stuff as the sleeves of the jacket. In short, they are so expensive in their dress, that a marriage-shift alone, frequently costs a thousand crowns. Their shoes, which have round toes, are always fastened with diamond buckles, or something very brilliant, in proportion to the ability of the wearer. Their hair, which is naturally black, and capable of reaching below the waist, they tie

up behind in six braided locks, through which is inserted a gold bodkin, with a cluster of diamonds at each end ; and on this the locks are suspended, so as just to touch the shoulders. On the front and upper part of the head, they wear diamond egrets, and the hair is formed into little curls, hanging from the forehead, to the middle of the ears, with a large black patch of velvet on each temple. Their earrings are of brilliants, intermixed with tufts of black silk, covered with pearls ; and, besides their necklaces, they wear rosaries about their necks, the beads of which are of pearls, either separate, or set in clusters. Their diamond rings, necklaces, girdles, and bracelets, are all very curious, both with regard to water and size ; many ladies wear a round jewel enriched with diamonds, suspended from their girdle, and much more superb than their other ornaments. In short, a lady thus dressed is supposed to wear, at one time, what costs no less than thirty or forty thousand crowns ; and yet the small value they seem to set upon them, by wearing them upon all occasions, is really surprising.

The women of Lima are generally of a middling stature, handsome, and genteel, with a remarkable lustre in their eyes ; and the charms of their persons are considerably heightened by those of the mind, as they have clear and comprehensive intellects, with an easy and graceful behaviour that commands both love and respect ; but they are so fond of perfumes that they constantly carry ambergrise about them, and, not content with the natural fragrance of flowers, of which they are likewise extremely fond, scatter perfumes even on their nosegays. The most beautiful flowers they place in their hair, and those most esteemed, for

their fragrance, they stick in their sleeves. Hence the effluvia issuing from these ladies reach to a considerable distance. The lower class of women, even to the very Negroes, endeavour as much as possible, to imitate their superiors in the fashion and richness of their dress ; and their cleanliness is observable in the extraordinary neatness of their houses. They are naturally gay, sprightly, and jocose, without levity, remarkably fond of music, and have, in general, very good voices.

The nobility are extremely courteous to strangers, who are charmed with their probity, politeness, candour, and magnificence. The natives of an inferior rank are said to have too great a share of pride, but are so grateful, that a few instances of kindness, make a lasting impression on their minds : the Mulattoes, however, being less civilized, are haughty, quarrelsome, and turbulent.

The viceroy of Lima usually resides in that city ; his government is triennial, and he has all the prerogatives of royalty, being absolute in all affairs, whether military, civil, criminal, or relating to the revenue. Under him are officers and tribunals, for executing the several departments of government ; and he fills up all vacant posts. For the security of his person, he has a body of a hundred and sixty horse guards, under the command of a captain and lieutenant, all in a blue uniform, richly laced with silver : a body of fifty halberdeers stationed in the rooms leading to the royal audience-chamber, whose waistcoats are of crimson velvet, with a broad gold lace : he has likewise, within his palace, another guard, consisting of a detachment from the garrison at Callao. All these are occasionally employed in executing his orders, and

enforcing the decrees of the tribunals, after their having received his assent.

Though the plague and many other diseases, that produce the most fatal effects in Europe, are here unknown, yet there are others that are no less painful and fatal. The most common at Lima are malignant, intermitting, and catarrhous fevers, constipations, pleurisies, and convulsions. These last are extremely dreadful, and are divided into two kinds, the common or partial, and the malignant. They both come when nature is struggling in the crisis of some acute disease; but those afflicted with the former often recover, though the greater part die on the third or fourth day; while those who have the misfortune of being attacked by the latter, sink under it in two or three days. Both are attended with insupportable anguish; so that the groaning patient cannot be moved even from one side to the other, without suffering inconceivable tortures. The throat is so contracted that nothing can be conveyed into the stomach, and the jaws are sometimes so closely shut, that it is impossible to open them. Thus the miserable patient lies motionless, and tortured in every part of his body. The malignant kind is even in the first stage so violent, as to cause a contraction of the nerves of the vertebræ from the brain downwards; which, with all the muscles, become more and more constricted all over the body, till it is drawn backward in the form of an arch, and all the joints are dislocated. Slow and hectic fevers also prevail here; and the venereal disease is so common in this and all the other parts of Spanish America, that it is considered as no dishonour, few persons being entirely free from it.

The inhabitants of Carthagena, like those of Lima, may be divided into different casts or tribes, who derive their origin from a coalition of whites, negroes, and Indians. It will, therefore, be necessary to treat of each particularly.

The whites may be divided into two classes, the Europeans and creoles, or whites born in the country. The former are commonly called chapitones, but are not numerous : most of them either return into Spain, after acquiring a competent fortune, or remove up into the inland provinces, in order to increase it. Those who are settled at Carthagena, carry on the whole trade of that place, and live in opulence, whilst the other inhabitants are indigent, and reduced to have recourse to mean and hard labour for subsistence. The families of the white creoles compose the landed interest ; some of them have large estates, and are highly respected, because their ancestors came into the country invested with honourable posts, bringing their families with them, when they settled here. Besides these, there are other whites, in mean circumstances, who either owe their origin to Indian families, or, at least, to an intermarriage with them ; so that there is some mixture in their blood : but when this is not discoverable by their colour, the conceit of being whites alleviates the pressure of every other calamity.

Among the other tribes, which are derived from an intermarriage of the whites with the negroes, the first are the mulattoes, so well known, that there is no necessity for saying any thing farther on this head. Next to these are the tercerones, produced from a white and a mulatto ; with some approximation to the former, but not so near as to obliterate their origin. After these

follow the quarterones, proceeding from a white and a terceron. The last are the quinterones, who owe their origin to a white and a quarteron. This is the last gradation, there being no visible difference between them and the whites, either in colour or features; nay, they are often even fairer than the Spaniards themselves. The children of a white and quinteron are also called Spaniards, and consider themselves as free from all taint of the negro race. Every person is so jealous of their tribe or cast, that if, through any inadvertence, without the least intention to affront, a stranger call them by a degree lower than what they actually are, they are highly offended.

Before they attain the class of the quinterones, there are several intervening circumstances which throw them back; for, between the mulatto and the negro there is an intermediate race, called samboses, owing their origin to a mixture between one of these with an Indian, or among themselves. They are also distinguished according to the casts their fathers were of. Betwixt the tercerones and the mulattoes, the quarterones and the tercerones are those called *tente en el ayre*, "suspended in the air;" because they neither advance nor recede. Children, whose parents are a quarteron or a quinteron, and a mulatto or terceron, are *salto atras*, or "retrogrades;" because, instead of advancing toward being whites, they have gone backwards towards the negro race. All the children between a negro and a quarteron, are called *sambos de negro, de mulatto, de terceron, &c.*

These are the most known and common tribes or casts. There are, indeed, several others, proceeding from their intermarriages; but being so

various, even they themselves cannot easily distinguish them.

These casts, from the mulattoes, all affect the Spanish dress, but wear very slight stuffs, on account of the heat of the climate. These are the mechanics of the city; the whites whether creoles or chapitones, disdaining such mean occupations, follow nothing below merchandise. But as it is impossible for all to succeed, great numbers, not being able to procure sufficient credit, become poor and miserable, from their aversion to those trades they followed in Europe; and, instead of the riches, which they flattered themselves with possessing in America, they experience the most complicated wretchedness.

In the house, the whole exercise of the ladies consists in sitting in their hammocks, and swinging themselves for air. This is so general a custom, that there is not a house without two or three, according to the number of the family. In these they pass the greater part of the day; and often men, as well as women, sleep in them, without minding the inconvenience of not stretching the body at full length.

Both sexes are observed to be possessed of a great share of wit and penetration, and also of a genius proper to excel in all kinds of mechanic arts. This is particularly conspicuous in those who apply themselves to literature, and who, at a tender age, show a judgment and perspicacity, which, in other climates, is attained only by a long series of years, and the greatest application. This happy disposition continues till they are between twenty and thirty years of age, after which they generally decline as fast as they rose; and frequently before they arrive at that age, when they

should begin to reap the advantage of their studies, a natural indolence checks their farther progress, and they forsake the sciences, leaving the surprising effects of their capacity imperfect.

The principal cause of the short duration of such promising beginnings, and of the indolent turn so often seen in these bright geniuses is, doubtless, the want of proper objects for exercising their faculties, and the small hopes of being preferred to any post answerable to the pains they have taken : for, as there is in this country neither army nor navy, and the civil employments are very few, it is not at all surprising, that the despair of making their fortunes by this method, should damp their ardor for excelling in the sciences, and plunge them into idleness, the sure forerunner of vice. The same is evident in the mechanic arts, wherein they early excel and speedily decline, from the causes already mentioned.

Charity is a virtue in which all the inhabitants of Carthagena may be said particularly to excel ; and did they not liberally exert it towards European strangers, who generally come hither, as they phrase it, to seek their fortune, they would often perish with sickness and poverty. This appears a subject of such importance, though well known to all who have visited this part of the world, that a few words must be added on it, in order to undeceive those who, not contented with, perhaps, a competent estate in their own country, imagine that it is only setting their foot in the Indies, and their fortune is made.

Those on board the galleons, who are called Pulizones, are men without employment, stock, or recommendation : who leave their country as fugitives, and, without licence from the officers,

come to seek their fortune in a country where they are utterly unknown. These, after traversing the streets till they have nothing left to procure them lodging or food, are obliged to have recourse to the last extremity, the Francisean Hospital, where they receive, not in a quantity sufficient to satisfy hunger, but barely to keep them alive, a kind of pap made of casava, which the natives themselves will not taste. As this is their food, so their lodging is the entrance of the squares and the porticoes of churches, till their good fortune throws them in the way of hiring themselves to some trader going up the country, and who wants a servant : for the city merchants, standing in no need of them, show no great countenance to these adventurers. Affected by the difference of the climate, aggravated by bad food, dejected and tortured by the entire disappointment of their romantic hopes, they fall into a thousand evils, which cannot easily be described ; and among others, that distemper called, Chapelanada, or the distemper of the Chapitones, without any other succour to fly to than Divine Providence ; for none find admittance into the Hospital of St. Juan de Dios, but those who are able to pay ; and consequently poverty becomes an absolute exclusion. Now it is that the charity of these people becomes conspicuous. The negro and mulatto, and other free women, moved at their deplorable condition, carry them to their houses, and nurse them with the greatest care and affection. If any one dies, they bury him by the charity they procure, and even cause masses to be said for him. The general issue of this endearing benevolence is, that the chapitone, on his recovery, during the fervor of his gratitude, marries either his negro or mu-

Iatto benefactress, or one of her daughters; and thus he is settled, but much more wretchedly than he could have been in his own country, though he had only his labour to subsist on.

The disinterestedness of these people is such, that their compassion towards the chapitones must not be imputed to the hopes of producing a marriage, it being very common for them to refuse offers with regard to themselves or their daughters, that their misery may not be perpetual; but endeavour to find them a master, whom they may attend up the country, whither their inclination, or fairer prospects lead them.

Those who remain in the city, whether bound by one of the above marriages, or engaged in some mean occupation, are so harassed with labour, and receive such small wages, that their condition in their own country must have been miserable indeed, if they had not reason to regret their quitting it. And the height of their enjoyment, after toiling all day and part of the night, is to regale themselves with some bananas, a cake of maize, or cassava, which serves for bread, and a slice of casajo, or hung beef; without ever tasting wheaten bread during the whole year. Others, equally unfortunate with the former, retire to some small farm house, where, in a bujio, or straw hut, they live little different from beasts, cultivating, in a very small spot, such vegetables as are at hand, and subsisting on the sale of them.

Among the reigning customs here, some are very different from those of Spain, or the most known parts of Europe. The principal of these are the use of brandy, cocoa, honey, sweetmeats, and smoking tobacco.

The use of brandy is so common at Carthagena,

that the most regular and sober persons of all degrees, never omit drinking a glass of it every morning about eleven o'clock, alleging that this spirit strengthens the stomach, weakened by copious and constant perspiration, and sharpens the appetite. *Hacer las once*, "to do the eleven," that is to drink a glass of brandy, is the common phrase. This custom, not esteemed pernicious by these people, when used with moderation, has degenerated into vice; many being so fond of it, that during the whole day, they do little else.

Chocolate, here known only by the name of cocoa, is so common, that there is not a negro slave but constantly allows himself a regale of it after breakfast; and the negro women sell it ready made about the streets, at the rate of five farthings sterling for a dish. This is, however, so far from being all cocoa, that the principal ingredient is, maize; but that used by the better sort is neat, and worked as in Spain. This they constantly repeat an hour after dinner, but never use it fasting, or without eating something with it. They also make great use of sweetmeats and honey; never so much as drinking a glass of water without previously eating some sweetmeats. Their sweetmeats are eaten with wheat bread, which they use only with these and chocolate; the honey they spread on casava cakes.

The passion for smoking is no less universal, prevailing among persons of all ranks in both sexes. The ladies, and other white women, smoke only in their houses, a decency not observed either by the women of the other casts, nor by the men in general, who regard neither time nor place. The manner of using it is, by slender rolls composed of the leaves of that plant; and the women

have a particular method of inhaling the smoke. They put the lighted part of the roll into their mouths, and there continue it a long time, without its being quenched, or the fire incommoding them. A compliment paid to those for whom they profess an intimacy and esteem, is to light their tobacco for them, and to hand it round to those who visit them. To refuse the offer would be a mark of rudeness not easily digested; and, accordingly, they are very cautious of paying this compliment to any but those whom they previously know to be used to tobacco.

One of the most favourite amusements of the natives here, is a ball, or fandango, after the manner of the country. And these are the distinguished rejoicings on festivals and remarkable days. These diversions, in houses of distinction, are conducted in a very regular manner; they open with Spanish dances, and are succeeded by those of the country, which are not without spirit and gracefulness.

The fandangos, or balls of the populace, consist principally in drinking brandy and wine, intermixed with indecent and scandalous motions and gestures; and these continual rounds of drinking soon give rise to quarrels, which often bring on misfortunes. When any strangers of rank visit the city, they are generally at the expence of these balls, and as the entrance is free to all, and no want of liquor, they need give themselves no concern about the want of company.

Their mournings and funerals are also something singular, as in these particulars they endeavour to display their grandeur and dignity, too often at the expence of their tranquillity. If the deceased be a person of condition, his body is placed on a

pompous catafalco, erected on the principal apartment of the house, amidst a blaze of tapers. In this manner the corpse lies twenty-four hours, or longer, for the acquaintance of the family to visit it at all hours; and likewise, the lower class of women, among whom it is a custom to come and lament the deceased. The funeral also is accompanied with the like noisy lamentations; and even after the corpse is deposited in the grave, the mourning is continued in the house for nine days.

Having given this account of the inhabitants of Lima and Carthagena, which may suffice for most of the Spanish cities, we shall now turn our attention to the manners and customs of the Indians in the audience of Quito.

These people, at present, seem to have no resemblance to those originally found in the country; but they appear to possess a happy serenity of mind, which no accident can disturb. In their mean apparel they seem as contented as a prince in the most splendid robes: they utterly disregard riches, and even the power and authority within their reach; so that it seems to be the same to an Indian whether he be created an alcade, or obliged to perform the very meanest office; for their regard for each other is neither increased nor diminished by such circumstances; and they are as well satisfied with their simple diet, as others with the most luxurious repasts. Fear cannot stimulate, respect induce, nor punishment compel them to shake off their natural indolence; and as scarcely any thing can prevail on them to work, whatever is necessary to be done is left to the Indian women, who, being much more active, spin and make the shirts and drawers which

orm the only apparel of their husbands : they likewise cook the provisions, grind barley, and brew a kind of beer called *chicha* ; while the husband sits squatting on his hams, looking at his busy wife.

The only domestic service the Indian men perform, is to plow their little spot of land, which is owned by the wife. When they have once squatted down, no reward can induce them to stir; so that should a traveller, who had lost his way, come to one of their cottages, the wife must say he is not at home. If he should alight and enter the cottage, the Indian would still be safe; for, having no light but what comes from a hole through the door, he could not be discovered; and, should he even see the Indian, neither intreaties, nor rewards, would induce him to stir a step. They are lively only in parties of pleasure, rejoicings, entertainments, and especially dancing; but the liquor must circulate briskly, and they continue drinking, till they are entirely deprived of sense and motion. Let it be remarkable that the Indian women and the young men, before they are of an age to contract matrimony, are never guilty of this vice, it being a maxim with them, that drunkenness is the privilege of none but masters of families, who have others to take care of them when they can take no care of themselves.

On the celebration of any solemnity, he who gives the entertainment, invites all his acquaintance, providing a jug of chicha for each, containing two gallons. If it be a large town, a table is placed in the court of the house, or, if be in a village, before the cottage; this is covered with a carpet only used on such occasions, and upon it is placed a slight repast. The women

present the chicha to their husbands in calabashes; till their spirits are raised, and then one plays upon a pipe and tabor, while others dance. Some of the best voices among the Indian women sing songs in their own language, those who do not dance squat down till it comes to their turn, and, when tired with intemperance and dancing, they all lie down together. These festivities sometimes continue three or four days, till the priest, coming among them, spills all the chicha, and disperses the Indians, lest they should get more.

In their cottages, both they and the animals they breed, live together. As they are fond of dogs, they are never without three or four, besides a hog or two, and a few poultry. These, with some earthen-ware, as pots and jugs, with the cotton which their wives spin, are all their effects, except two or three sheep-skins, which serve them for beds. Though the Indian women breed fowls and other domestic animals in their cottages, they will neither eat nor sell them: so that, if a traveller, who is obliged to pass the night in one of their cottages, offers ever so much money for a fowl, they refuse to part with it, and he is obliged to kill the fowl himself, at which the good woman shrieks and bursts into tears, till, seeing no remedy for what is past, she wipes her eyes, and quietly takes what the traveller offers her.

As in their journeys they frequently take their whole family with them, they fasten the door with a string or thong of leather, which serves for a lock; and if their journey is to last several days, they take their animals to the cottage of some neighbour or acquaintance; if otherwise they leave their dogs to guard them, and these discharge their trust with such fidelity, that they

will fly at any one, except their masters, who offers to enter the cottage. It is observed, that dogs bred by the Spaniards and Mestizos have such a hatred to the Indians, that, if one of them approaches a house where he is not very well known, they fall upon him, and, if not called off, tear him to pieces; for they know them at a distance by their scent. On the other hand, the dogs of the Indian breed are animated with the same rage against the Spaniards and Mestizos, whom they also smell at a distance.

The Indians of this country act contrary to all other nations in their marriages; for they never choose a woman who has not been first known by some body else, which they consider as a certain sign of her having something pleasing in her. A young man having asked the object of his affections, of her father, and obtained his consent, they immediately begin to live together as man and wife. But, at the end of three or four months, and frequently of a year, he leaves her without any ceremony, and perhaps expostulates with his father-in-law, for imposing upon him, by giving him his daughter, whom no body else had thought worthy of making his bedfellow. But, if nothing of this happens after passing three or four months in this commerce they then marry. This custom is still very common, though the whole body of the Spanish clergy have used their utmost endeavours to put a stop to it.

These Indians show their intrepidity upon many occasions, especially in the alacrity and resolution with which they halter a bull or bear full speed; for a single Indian, with only a horse and his noose, never fails of getting the

better of all the cunning and rage of the most furious bear. This noose is made of a cow-hide, so thin as not to be seized by the beast's paw, and strong enough not to be broken by his struggling. On perceiving this animal, they directly make towards him, while he rears himself up, in order to seize the horse. But the Indian being advanced within a proper distance, throws the noose about the bear's neck, and, fastening the other end to the saddle, instantly claps spurs to his horse ; and the bear unable to run so fast as he gallops, and struggling to get free, is choaked. In short, great part of the rusticity of the Indians is owing to the want of education ; for, where they have enjoyed that advantage, they are found to have as good rational faculties as other men. Hence all the Indians, brought up to handicraft trades in cities and large towns, appear far more acute and sensible than those who have spent their lives in little villages ; and many of these distinguish themselves by their genius and abilities.

We shall now take a view of the inhabitants of Brasil, who are composed of Portuguese, Creoles, Negroes, and Brasilians. The Portuguese, born in Europe, enjoy the places of trust and profit, and are the fewest in number : the Creoles, or those born of Portuguese parents in Brasil, are more numerous ; and the Mestizos, or mixed breed, are more numerous than either, few of the Portuguese having been without black or tawny mistresses ; and, their issue having intermarried, they are multiplied extremely. The Negroes are likewise very numerous, and are much more valued than the Brasilians, from their being more robust and fitter for labour ; the latter indeed, are

few in number, the Portuguese, in the invasion of the country, like the Spaniards in their conquests, destroying the unfortunate natives by every method of cruelty.

The most judicious travellers describe the Portuguese and Creoles of Brasil, as sunk into the most effeminate luxury, and practising the most desperate crimes ; and, in short, as hypocritical, disssembling, lazy, proud, and cruel. In their diet, however, they are penurious ; for, like the inhabitants of most southern climates, they are fonder to show, state, and attendance, than of the pleasures of free society ; yet their feasts, which are seldom made, are extravagantly sumptuous. This character, which is represented as particularly bad with respect to the Creoles, has been attributed to their being bred up among slaves, who perform all the business ; and to their being permitted to keep a prodigious number of Negroes, not merely to work in the field, nor for domestic employments, but to attend their persons, and form their train. These they render as corrupt as themselves, by making them the instruments of their crimes, and employing them as bullies or assassins, whenever they are disposed to terrify or seek revenge. Nothing indeed can be more adapted to create the worst disorders, than the unnatural junction of slavery, idleness, and a licentious life. These Negroes are suffered to go armed, and there are vast numbers who have either merited or bought their freedom ; and this is allowed in a country where the Negroes are said to be ten to one of the Portuguese and Creoles.

The Portuguese call the Brasilians, who inhabit the north part of the country, Tapuyers, and

those who dwell in the south Tupinambes, but divide them into several petty nations, differing in language, though very little in their manners and customs. The Tapuyers are of a good stature, and of a dark copper colour, with black hair hanging over their shoulders ; but they have none on their bodies or faces, and go almost naked, the women only wearing a slight covering of leaves round their waist. They are, however, adorned with glittering stones hung upon their lips or nostrils, bracelets of feathers about their arms, and a circlet of feathers upon their heads. Some paint their bodies with various colours, while others, rubbing themselves over with gum, stick beautiful feathers upon them, which makes them appear at a distance more like fowls than human creatures. The Tupinambes who inhabit the south of Brasil are of a moderate stature, and a fairer complexion than their northern neighbours who lie nearer the line ; but neither of them are so black as the Africans in the same latitude ; for there were no Negroes in America before they were transported thither by the Portuguese and Spaniards. These people however, have flat noses, which are not natural, but made so in their infancy, a flat nose being there esteemed a beauty ; they have also black curled hair on their heads, and paint themselves like the northern Brasilians.

They have been represented by many writers as cannibals, and all the Brasilians have been charged with eating human flesh ; but this appears to have been a slander cast upon them, to give a colour to the cruel treatment they have met with from their conquerors ; nor will the Portuguese allow that they had any kind of religion, and yet

confess that they had priests, and admitted of a state of rewards and punishments, according to their valour or cowardice. Their prevailing religious notions are, that there are certain invisible beings, the dispensers of good and evil, the rewarders of virtue, and the punishers of vice; and that, after death, the good shall visit their ancestors who dwell in a delightful place beyond the Andes. They have always been remarkable for their hospitality and civility to strangers: those who live near the Portuguese are a tractable and ingenuous people, ready to learn any art or science the Portuguese will teach them; and like nothing so kindly of the priests as their instructing their children, which has given them an opportunity of making many converts; and, in short, those who live under the Portuguese, generally conform to their customs in eating, drinking, and clothing.

Before we leave the inhabitants of South America, it may be proper to observe that, from a voyage made by commodore Byron round the world, there is undoubted testimony of there being a people on the most southern extremity of America, of an extraordinary size. The commodore, with a number of his men, landed, and, after many amicable signs, presented these people with a number of trinkets, as strings of beads, bands, &c. The commodore, to facilitate the distribution of them, made these Indians sit down on the ground, that he might put the strings of beads, &c. round their necks; and such was their extraordinary size, that in this situation they were almost as high as the commodore. Their middle stature seemed to be about eight feet, their extreme nine and upwards. Their cloth-

ing consisted of the skins of Peruvian sheep, which reached from their shoulders down to their knees ; and their hair was black, long, and flowing down behind. The stature of the women was equally surprising with that of the men, and their faces painted in a most extravagant manner. Some of the women had collars on their necks, and bracelets on their arms ; and the infants, who were carried by their mothers, had a largeness and strength of features, which, considering their age, seemed to bear some proportion to those of their parents. The people, thus gigantic in their size, appeared extremely humane and friendly. They had all the symptoms of a gentle and benevolent disposition, and were so delighted with the different trinkets which they had an opportunity of viewing, as they hung on their necks and fell down on their bosoms, that the commodore could scarcely restrain them from caressing him. They made signs to the commodore, and that part of the ship's crew which landed, to go with them towards some smoke which appeared at a distance, pointing to their mouths, as if they intended to give them some refreshment ; but it was thought improper to comply with this friendly invitation ; and, when the English left them, they appeared greatly afflicted. These people have been mentioned by several authors, but there wanted sufficient evidence of the truth of their existence, till the publication of a voyage round the world, under commodore Byron, which bears indubitable marks of authenticity.

CHAP. II.

OF NORTH AMERICA.

Situation; Climate, Soil, &c.

NORTH America is that grand division of the New World which extends north and south, from about the tenth degree of north latitude to the north pole; and east and west, from the forty-fifth to the hundred and sixty-fifth degree of longitude from London. It is bounded by the Arctic icy ocean on the north; by the Atlantic on the east; by South America on the south; and by the Pacific ocean and the sea of Kamtschatka on the west.

This extensive tract of country comprehends the Spanish territories of Mexico or New Spain, New Mexico, Louisiana, Florida, and California; the United States; and the British colonies of New Britain, Canada, and Nova Scotia. Besides these there are immense regions to the north and west, the boundaries of which have never yet been discovered.

Mexico, or New Spain, (which was for several ages a great and flourishing monarchy) extends from seven degrees thirty minutes to thirty degrees forty minutes of north latitude. It is bounded on the south-east by the isthmus of Darien; on the east by the north sea and the gulph of Mexico; on the south and west by the Pacific ocean; and on the north-west by New Mexico. This prodigious country stretches along the Pacific ocean above two thousand miles, and the coast towards the

Atlantic ocean is no less than sixteen hundred in extent, but the breadth is extremely unequal, for to the north-west it is supposed to be between six and seven hundred miles over, while towards the south-east it is confined to the isthmus, which in the narrowest part is not much above sixty miles broad.

The greatest part of this country lying within the torrid zone, the air is extremely hot, but it is qualified with refreshing showers, and with alternate land and sea breezes; in some parts the vapours rising from a great number of lakes and rivers cool the air, and render it mild and pleasant. The greatest heats are during the months of February, March, and April, when the sun is seldom obscured by clouds. The rainy season begins towards the close of April, and continues till the month of September; and is always preceded by tempests of thunder and lightning, which increase till June, when the rain falls in torrents. On the eastern coast, where the land is low and marshy, the air is extremely unhealthy, and the land incumbered with almost impenetrable woods of mangroves, that have a bare and disagreeable aspect, and extend a considerable way into the water. The inland country assumes a more agreeable appearance, the air is more temperate, and the soil extremely fertile. On the western side the land, being not so low as on the eastern, is much better and abounds with plantations. In general, few places under the same climate enjoy more of the benefits of nature, and of the necessaries and luxuries of life; but, like all the tropical countries, it abounds more with fruit than with corn.

The province of New Mexico is supposed to extend between the 28th and 38th degrees of north

latitude. On the north is bounded by high mountains, and a country entirely unknown to Europeans; on the east it has the country of Louisiana; on the west the Californian lake and the river Colorado; while on the south it is bounded by Old Mexico; but the far greatest part of this country is still in the hands of the natives, who have the happiness to enjoy their liberty.

As it is seated in the midst of the temperate zone, it enjoys an agreeable climate; for, though the summers are very warm, and the winters pretty sharp, the former are neither stifling nor unhealthy, nor the latter intensely cold, nor deluged with floods of heavy rain, but the air is clear and salubrious. The country is finely watered with rivulets and rivers, but few of them are large or navigable. The land is beautifully interspersed with rising grounds and fertile plains, covered with trees, some of which are fit for timber, and others produce various kinds of fruits. In short, it is affirmed to be one of the pleasantest, richest, and most plentiful countries in the world. However, as in all the other Spanish settlements, only an inconsiderable part of the country is cultivated; compared with its extent.

The peninsula of California is the most northern part of the Spanish dominions on the continent of America. It was for a long time considered as an island, but is now found to be a peninsula in the Pacific Ocean, issuing from the north coast of America, and extending from cape Sebastian in 43 degrees 30 minutes north latitude to the south-east, where it is terminated by St. Lucar, in latitude 22 degrees 32 minutes, the whole peninsula being eight hundred miles in length. On the north it is bounded by an unknown part of

the continent ; on the east by the province of New Mexico ; from which it is separated by the gulf of California, which some call the Purple, and others the Vermilion sea ; and by the Pacific ocean on the south and west.

Though California lies for the most part in the temperate zone, the coast is very hot in summer, but within land the air is more temperate. In winter it is very cold but healthy ; however, in so extensive a country there must be great variations both of climate and soil ; and it has not only many of the most inhospitable deserts in the universe, but some of the most beautiful lawns, delightful woods, and enchanting pastures and meadows. But, though this extensive country is said to be subject to Spain, they have only one small Spanish town, which is seated near the Cape of St. Lucar ; and no other use is made of it than as a place of refreshment for the Manilla ships, and its being the head residence of the missionaries, a number of whom have settled in the country, in order to propagate the Romish religion.

Louisiana was, till lately, considered by several of the powers of Europe as a much more extensive country, than it is at present, it being represented by M. de Lisle, as extending on the north to Canada ; on the east to the provinces of Georgia, Carolina, Virginia, Pennsylvania, and New York : on the south to the gulf of Mexico ; and on the west to New Mexico, New Spain, and unknown countries inhabited by the Indians.

The country, at present termed Louisiana, extends from the 29th to the 40th degree of north latitude ; and from about the 88th to the 96th or 97th degree of west longitude from London. Though the soil is very indifferent near the mouth

of the Mississippi, the country contains a great deal of excellent land, well stocked with a variety of trees, planted by the hand of nature. The isle of Orleans, at the mouth of the Mississippi, is a very beautiful and fertile spot of ground, on which the French had a considerable city named New Orleans, which is the capital of Louisiana ; and here the Spanish governor resides. About seven eighths of the town were destroyed by fire, in the space of five hours, in the year 1788, but it has been rebuilt since that unfortunate accident.

The country to which the Spaniards gave the name of Florida, is a peninsula, bounded by Georgia on the north ; by the Mississippi and the gulf of Mexico on the west ; by that of Florida on the south ; and by the channel of Bahama and the Atlantic ocean on the east ; extending from Georgia to cape Florida, between 25 degrees 6 minutes, and 30 degrees 58 minutes north latitude. It is divided into east and west Florida, the former comprehending the coast washed by the Atlantic ocean, and the latter that near the gulf of Florida and Mississippi. The air, though hot, is pure and wholesome ; and the soil, at a little distance from the coast, where it is generally sandy, is remarkably rich and fruitful. It abounds with all kinds of timber, particularly oak, cypress, palm, cedar, pines, and chesnut trees ; and sassafras is in particular found in the greatest plenty ; excellent oranges, peaches, limes, mulberries, cocoas, plumbs, and many other fruits of a delicious flavour, grow here in great abundance ; likewise olives, and vines of various sorts are the natural produce of the country ; and the land is thought to be as proper for the cultivation of the grape, as the warm countries of Europe.

We must now turn our attention to the Independent and United States of America, including New England, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, Kentucky, North Carolina, South Carolina, Georgia, the Western Territory, and Vermont.

New England is a high and mountainous country, formed by nature to be inhabited by a vigorous and hardy race. The mountains are comparatively small, running nearly north and south in ridges parallel to each other; and between these ridges flow the great rivers in majestic meanders, receiving the innumerable rivulets and streams which proceed from the mountains on each side. —On the sea coast, the land is low, and in many parts level and sandy, but in the valleys between the mountains, it consists of a strong rich soil, capable of being cultivated to good advantage.

New Hampshire, embosoming a number of very high mountains, and lying contiguous to others whose lofty summits are covered with snow and ice three quarters of the year, is intensely cold in the winter season, and even in summer, the heat is of short duration: the air, however, is generally serene and healthful, and the labouring people enjoy an excellent state of health. The soil, in many places, is sandy, but affords excellent pasturage; and the intervals at the foot of the mountains are greatly enriched by the showers which bring down the soil upon them, forming a fine mould, and producing exuberant crops of corn and herbage. The back lands which have been cultivated, are generally very fertile, and produce various kinds of grain, fruits and vegetables; and the uncultivated

lands are covered with extensive forests of pine, cedar, walnut, fir, &c.

Massachusetts extends about a hundred and ninety miles in length, and ninety in breadth, and is blessed with a tolerably agreeable climate. The soil consists of all kinds of varieties from the best to the worst, and produces several sorts of grain, edible roots, and other vegetables. It is divided into seventeen counties, and in the year 1795, it contained about two hundred and seventy towns. The province of Main belongs to this state.

Rhode Island is as healthful a country as any part of the United States; for in summer, the extreme heats which prevail in other parts of America are allayed by refreshing breezes; and in winter the air is softened by a marine vapour, which also enriches the soil. The western and north-western parts of the state are barren and rocky, but in some parts the land affords excellent pasture, together with culinary plants and roots in great variety and abundance.

Connecticut, though subject to the extremes of heat and cold in their seasons, appears to be remarkably healthful, as the major part of its inhabitants attain to longevity. In the maritime towns the weather is variable, according as the wind blows from the sea or land: but towards the inland parts, the sea-breezes have less effect upon the air, and the weather is consequently more settled. The north-west winds, in the winter season, are often extremely piercing, owing to the great bodies of snow which lie in the immense forests north and north-west. But the clear and serene temperature of the sky makes amends for this severity, and is peculiarly conducive to health.

This state consists, for the most part, of broken

land, made up of mountains, hills, and valleys ; and is exceedingly well watered.—Some small parts of it are thin and barren, but in general, it has a strong and fertile soil, and is very well calculated for pasture and mowing.

New York, for the most part, is intersected by ridges of mountains, running in a north-east and a south-west direction. Beyond the Allegany mountains, however, the country is a dead level, of a fine rich soil, covered in its natural state with maple, beech, walnut, hickory, and mulberry trees. Hemlock swamps are interspersed thinly through the country ; but the hills are thickly clothed with timber, and the valleys, when properly cultivated, produce good crops of wheat, hemp, flax, peas, oats, and Indian corn. The best lands, however, which lie along the Mohawk's river, and to the west of the Allegany mountains, are yet in a state of nature, or are just beginning to be settled.

New Jersey contains all the varieties of soil ; but it has a greater proportion of *barrens* than any of the other states. The good land in the southern counties lies principally on the banks of rivers and creeks, and consists of a stiff clay, which produces various species of oak, hickory, poplar, chesnut, ash, &c. There are some large tracts of salt meadow along the Delaware, which afford plentiful pasturage for cattle in summer, and hay in winter, but they are infested with prodigious swarms of flies and musquitoes, which prove extremely troublesome both to man and beast. Along the sea-coast, the inhabitants subsist principally by feeding cattle on the salt meadows ; and the swamps afford lumber, which is easily conveyed to a good market.

“ In the hilly parts of the state, which are not too

recky for cultivation, the soil produces wheat, rye, Indian corn, oats, barley, and fruits of all kinds common to the climate. Some of the lands also in these parts are fit for grazing; and many of the farmers keep large dairies.

Pennsylvania, which is one of the finest countries in America, is about two hundred and eighty-eight miles in length, and nearly a hundred and fifty-six in breadth; being bounded on the north by the country of the Iroquois or Five Nations; on the east by the Delaware river; and on the south and west by Maryland. The air is peculiarly sweet and serene; and during the spring, which continues from March till June, the weather is extremely pleasant. In the months of July, August, and September, the heats would be almost intolerable, if they were not mitigated by frequent cool breezes; and the winters are excessively cold. But the inhabitants never feel those quick transitions from cold to heat, by a change of the wind from north to south, as those who live eastward of the Allegany mountains, and near the sea.

Almost one third of this state may be called mountainous, particularly some countries through which pass, under various names, the numerous ridges which collectively form what geographers stile, "the great range of Allegany mountains." There is a remarkable difference between the country on the east and west side of this range; for between the mountains and the lower falls of the rivers which run into the Atlantic, are several ranges of stones, sand, earths, and minerals, which lie in the utmost confusion; and between these lower falls and the ocean is a very extensive collection of sand, clay, mud, and shells, partly thrown up by the sea, and partly brought down

by the floods from the upper country. But on the westward of the Allegany mountains the country, in these respects, is totally different. It is very irregular, broken, and variegated, but it contains no mountains; and all the various strata of stone appear to have lain undisturbed in the situation wherein they were first formed. The layers of clay, sand, and coal, are nearly horizontal; and every appearance tends to confirm the opinion, that the original crust in which the stone was formed, has never been broken up on the west side of the mountains, as it evidently has been eastward of them.

Delaware is, for the most part, a low flat country, and a considerable portion of it lies in forest. What has been cultivated is chiefly barren, except in Indian corn, of which it produces exuberant crops. In some parts, however, the soil is more fertile, and produces large quantities of wheat and all the other kinds of grain common to Pennsylvania. The forests contain a profusion of tall pines, which are manufactured into boards, and exported in large quantities, into every sea-port in the three adjoining states. The climate, in many parts is very unhealthy, owing to the flatness of the land and the stagnation of the waters; and the inhabitants are very subject to intermittents.

Maryland is bounded on the north by Pennsylvania and Delaware bay; on the east by the Atlantic ocean; on the south by Virginia; and on the west by the Apalachian mountains. It is seated between the 38th and 40th degrees of north latitude, and between the 44th and 48th degrees of west longitude, extending about one hundred and forty miles in length from north to south, but not so much in breadth. This province is divided into

the eastern and western divisions by Chesapeak' bay. Though in summer the air is excessively hot, and in winter very cold, while the north wind blows, yet the heats are seldom troublesome, and then only in a perfect calm, which seldom happens above two or three days in the year ; and then only a few hours at a time, when it is rendered very tolerable to the inhabitants by their cool shades, their open and airy rooms, arbours and grottoes. The weather, in spring and autumn, is as pleasant as can be wished : even the winters do not last above three or four months, and in these they have seldom one month's bad weather. That part of the country which lies on the bays of the sea and the mouths of the rivers, is hot and moist ; but, higher up in the country, the air is more agreeable. In the heat of summer indeed they have dreadful thunder ; but as it cools and refreshes the air, the people rather wish for than fear it.

The face of the country is divided into low lands next the sea, the hilly country towards the heads of the rivers, and the Allegany or Apalachian mountains, which rise to a great height, and extend from the north-east to the south-west, parallel to the Atlantic ocean. The soil here is as fruitful as in any other country, the principal part being a large plain interspersed with hills of so easy an ascent, and of such a moderate height, that they rather seem an artificial than a natural ornament. Abundance of rivers and brooks diffuse fertility through the country, and every tree, plant, and grain that grows in Virginia, thrives as well here.

Virginia, which was thus called in honour of queen Elizabeth, is a very extensive territory, being situated between the 36th and 39th degrees

of north latitude, and between the 74th and 80th degrees of west longitude ; and extending about two hundred and forty miles in length from north to south, and about one hundred and twenty in breadth from east to west. It is bounded on the north by the river Potowmac, which separates it from Maryland ; on the east by the bay of Chesapeake ; on the south by Carolina ; and on the west by the Allegany mountains. Heat and cold, both here and in Maryland, are governed by the winds ; the north and north-west winds being commonly cold and clear, but the south and east moist, hazy, and very hot. The air is dry and clear in winter, and, though the snow falls in great quantities, it seldom lies above a day or two. The changes of the weather are here sudden and violent ; the winter frosts come on without the least warning ; and a warm day, in the beginning of winter, is frequently succeeded by so intense a cold, as to freeze the rivers in one night ; but the frosts and rains, though violent, are of short continuance.

The face of the country is so extremely low towards the sea, that, on coming within fifteen fathoms soundings, land can scarcely be distinguished from the masthead. All this coast of America has one remarkable particularity, the distance being known by the soundings, which gradually diminish as you approach the land. The trees at first seem to rise out of the water, affording the stranger a very uncommon and pleasing view. In sailing to Virginia or Maryland, you pass a strait between two points called the Capes of Virginia, which opens a passage into the bay of Chesapeake, one of the largest and safest bays in the world ; for it enters the country nearly three hundred miles from the south to the north, hav-

ing the eastern side of Maryland and a small part of Virginia on the same peninsula. This bay is almost eighteen miles broad for a considerable way, and seven, where it is narrowest ; and through its whole extent receives a great number of fine navigable rivers, particularly James River, York River, the Rappahannock, and the Potowmac. The last mentioned river is nine miles broad at its mouth, and navigable for near two hundred miles. Towards the mouth of the rivers, the land has a moist and fat mould, well stored with oaks, poplars, pines, cedars, cypress, and sweet gums. The country also produces great variety of evergreens. The trees grow to a prodigious height before they shoot into branches ; and the woods, not being encumbered with shrubs and underwood, so as to hinder their being travelled through on horseback, afford a commodious shade to those who pass through them. The heads of the rivers afford a mixture of hills, valleys, and plains, adorned with fruit and timber trees.

An author, born in Virginia, thus describes the country : " Here the people enjoy all the benefits of a warm sun, and by the shady groves are protected from its inconveniences. Here all their senses are entertained with an endless succession of native pleasures. Their eyes are delighted with the beauties of nature : their ears serenaded with the perpetual murmur of brooks, and the thorough base, which the wind plays, when it wantons through the trees ; the merry birds join their pleasing notes to this rural concert, especially the moek-birds, who love society so well, that, whenever they see any human beings, they will perch upon a twig very near them, and sing the sweetest wild airs

in the world ; but, what is most remarkable in these melodious animals, they will frequently fly at small distances before a traveller, warbling out their notes for several miles, and by their music make a man forget the fatigues of his journey. The taste of the inhabitants is regaled with the most delicious fruits, which they have without art, in great variety and perfection ; and their smell is refreshed with a perpetual fragrancy, with which nature perfumes and adorns the woods almost the year round. Have you pleasure in a garden ? In the gardens all things thrive most surprisingly ; and you cannot walk by a bed of flowers, but, besides the entertainment of their beauty, your eyes will be saluted with the charming colours of the humming-bird, which revels among the flowers, and sucks off the dew and honey from their tender leaves, on which it only feeds." This country produces all sorts of English grain ; but the cultivation of tobacco employs the principal attention of the inhabitants.

North Carolina is situated between 34 and 36 degrees of north latitude, and between 1 and 16 degrees of west longitude, being bounded by Virginia on the north ; by the Atlantic Ocean on the east ; by South Carolina and Georgia on the south ; and by the Mississippi on the west. This state in its whole width, for sixty miles from the sea, is a dead level, a considerable part of which lies in forest, and is barren. On the banks of some of the rivers, however, the land is very good ; and through the other parts are interspersed glades of rich swamp, and ridges of oak land, of a black fertile soil. Wheat, barley, rye, oats, and flax are successfully cultivated in the back hilly

country, and Indian corn grows plentifully in all parts. Cotton is also cultivated here to considerable advantage. In the western parts of the state, the air is serene for the greatest part of the year, and the natives enjoy a much better state of health than those of the flat country. Though the days in summer are excessively hot, the evenings are cool and refreshing. Autumn is very pleasant, both with respect to the temperature and serenity of the weather, and the richness and variety of the vegetable productions which the season affords. The winters, also, are frequently so mild, that autumn may be said to continue till spring.

South Carolina is situated between 32 and 35 degrees of north latitude, and between 4 and 9 degrees of west longitude, being bounded on the north by North Carolina, on the east by the Atlantic; on the south by Savannah river which divides it from Georgia: and on the west by some unknown states. The whole state, to the distance of eighty miles from the sea, is level, and almost without a stone. In this distance, by a gradual ascent from the coast, the land rises about a hundred and ninety feet; and here commences a curiously uneven country. "The traveller," says Dr. Morse, "is constantly ascending or descending little sand-hills, which nature seems to have disunited in a frolic; for if a pretty high sea were suddenly arrested, and transformed into sand hills in the very form the waves existed at the moment of transformation, it would present the eye with just such a view as is here to be seen." This curiosity continues for sixty miles, till you arrive at a place called "The Ridge," a fine healthy belt of land, extending from the Savannah to Broad River. Beyond this ridge commences a country

exactly resembling the northern states; where hills and dales, with all their verdure and variegated beauties present themselves to view. Here heaven has bestowed its blessings with a most bounteous hand.—The air is much more temperate and healthy than nearer to the sea; the hills are covered with valuable woods; the valleys are watered by beautiful rivers; and the fertility of the soil is equal to every vegetable production.

The climate varies considerably in different parts of the state. Along the sea coast, bilious diseases and fevers of all kinds are prevalent between July and October. The probability of dying is much greater between the 20th of June and the 20th of October, than in the other eight months of the year. These diseases are said to result principally from the exhalations of the stagnated waters, the heavy fogs and dews, and an imprudent exposure to the night air. The upper country, situated in the medium between heat and cold, is as healthful as any part of the United States.

Georgia, the most southern of the United States, is about six hundred miles long, and two hundred and fifty broad, being bounded on the north by South Carolina; on the east by the Atlantic Ocean; on the south by Florida; and on the west by the Mississippi.—The eastern part of this state between the mountains, the ocean, and the Savannah river is a level tract of a hundred and twenty miles long from north to south, and from forty to fifty broad, without a single hill or stone. About forty-five miles from the sea coast however, the lands begin to be uneven, ridges gradually rise into hills, and these swell into mountains, till, at length, they terminate in the Allegany mountains in New York.

The winters in Georgia are very mild and pleasant; but the soil and its fertility are various, according to situation and improvements. The cultivated lands produce rice, indigo, cotton, Indian corn, potatoes, oranges, figs, &c. Rice is, at present, the staple commodity; but great attention is also paid to the cultivation of tobacco.

The Western Territory comprehends all that part of the United States which lies on the north west of the Ohio, being bounded by the Lakes on the north; by Pennsylvania on the east; by the Ohio river on the south; and by the Mississippi on the west.—Colonel Gordon, speaking of a much larger tract of country in which this is included, has the following observations. “The country on the Ohio is every where pleasant, with large level spots of rich land, and remarkably healthy. One general remark of this nature may suffice for the whole tract comprehended between the western skirts of the Allegany mountains; thence running south-westwardly for a distance of five hundred miles to the Ohio falls; then crossing them northerly to the heads of the rivers that empty themselves into the Ohio; and thence passing along the ridge that separates the lakes and the Ohio’s streams, to French Creek. This country from a proper knowledge of it, may be justly stiled, the most healthy, the most pleasant, the most commodious, and most fertile spot of earth, known to the European people.”

“The lands that feed the various streams above mentioned are now pretty accurately known, and may be described with accuracy and precision. They are interspersed with all the variety of soil which conduces to pleasantness of situation, and lays a foundation for the wealth of an agricul-

tural and manufacturing people. Large natural meadows, from twenty to fifty miles in circuit, are every where found bordering the rivers, and variegating the country in the interior parts. These afford as rich a soil as can be imagined, and may be reduced to proper cultivation with very little labour.

"Very little waste land is to be found in any part of this tract of country. There are no swamps; and though the hills are pretty numerous, they are gentle and swelling, no where high, nor incapable of tillage. They are, for the most part, of a deep rich soil, covered with a heavy growth of timber, and well adapted to the production of wheat, rye, indigo, tobacco, &c."

Vermont is about a hundred and fifty miles long and about sixty broad; being bounded by Canada on the north; by Connecticut river on the east; by Massachusetts on the south; and by New York on the west. The country is generally hilly, finely watered, and clothed with a profusion of excellent pasture. The heavy growth of timber, which is common throughout the state, evince the strength and fertility of the soil. The wheat is frequently cut off by the early frosts, particularly on the mountains; but potatoes, pumpkins and various other vegetables are cultivated with success.

The climate of Vermont is remarkably healthy. Snow commonly begins to fall in the beginning of November, and is generally gone by the middle of April. During this season, the inhabitants enjoy a serene sky and a keen clear air; and at the return of spring, the snow is dissolved so gradually by the warm influences of the sun, that the earth is enriched and moistened, and all the vegetable tribes come forward with surprising quickness.

NEW BRITAIN is a large country of North America, called also *Terra Labrador*. It is bounded by Hudson's Bay on the north and west; by Canada and the river St. Lawrence on the south; and by the Atlantic Ocean on the east. The best description of this country that has ever been laid before the public, was drawn up by the commander of the Otter sloop, and communicated to the Royal Society by the Hon. D. Barrington, in 1774.

" This tract of land," says our author, " is extremely barren, and altogether incapable of cultivation. The surface is every where uneven, and covered with stones, some of which are of amazing dimensions. There are but few springs; yet throughout the country there are prodigious chains of lakes, or ponds, which are produced by the rains and the melting of the snow. There is here no such thing as level land; but the country consists entirely of frightful mountains and unfruitful valleys. The hills are almost devoid of every sort of herbage, and the valleys are full of crooked low trees, such as the different pines, spruce, birch, and a species of cedar. In a word, the whole country exhibits little besides a prodigious heap of barren rocks. The climate is extremely rigorous; for there is but little appearance of summer before the middle of July, and in September the approach of winter is very evident.

" The superficial appearance of this country is very unfavourable. But what may be hidden in its bowels we cannot pretend to suggest: probably it may produce some copper, as the rocks in many places are impregnated with an ore of that nature. Something of a horny substance, which is perfectly transparent, and which will scale out into a multitude of small sheets, is often found among the

stones, and, having been tried in fire, it seems to be no way affected by the heat."

CANADA, or the province of Quebec, is situated between forty-five and fifty-two degrees of north latitude, and between sixty-one and eighty-one degrees of west longitude ; being bounded by New Britain on the north ; by the bay of St. Lawrence on the east ; by Nova Scotia and the United States on the south ; and by some unknown lands on the west:

The climate of this country is not very different from that of the northern British colonies ; but as it is much further from the sea, and more to the northward, it has a much severer winter ; though the air is generally clear, and the summers are exceedingly pleasant. The soil in general is good, and in many parts extremely fertile ; producing a great variety of grain, fruits, and vegetables. The meadow grounds, which are well watered, yield excellent grass, and breed vast numbers of cattle. The uncultivated parts are a continued wood, composed of prodigiously large and lofty trees, of which there is an immense variety.

Nova Scotia, situated between forty-three and forty-nine degrees of north latitude, and between sixty and sixty-seven degrees of west longitude, is bounded by the river St. Lawrence on the north ; by the Atlantic Ocean on the east and south ; and by Canada and New England on the west.

The face of the country, when viewed at a distance, presents an agreeably variegated appearance of hills and valleys, with scarcely any thing like mountains to interrupt the prospect. A nearer approach discovers those sublime and beautiful scenes, which are so far superior to all the gaudy

embellishments of art. Immense forests of lofty trees every where cover and adorn the land ; their leaves falling in autumn, add continually to the crust of moss, vegetables, and decaying wood, that has been accumulating for many ages ; whilst the rays of the sun, unable to penetrate the thick shade which every where covers the ground, leaves it in a perpetual state of damp and rottenness.

The land, throughout the peninsula, is in no part mountainous, but frequently rises into hills of gradual ascent, which are every where covered with wood. From these arise numerous springs and rivulets, which not only fertilize the country, but have formed in the midst of it, a large lake of fresh water. The soil is, for the most part, very rich, particularly at a distance from the sea ; and the woods abound with very valuable trees.

This country, like Canada, is subject to long and rigorous winters, and these are frequently succeeded by sudden and violent heats ; but the climate is not accounted unhealthy. The air, in winter, is generally sharp, dry, and frosty, and the sky serene and unclouded ; by which every kind of exercise adapted to the season, is rendered pleasant and invigorating.—The winter commonly breaks up with heavy rains, and the inhabitants experience hardly any of the delights of spring, which in many parts of Europe is accounted the most agreeable season of the year.—From a lifeless appearance, and the dreary scenes of winter wrapped around the vegetable world, the country is suddenly transformed to a most animated and cheerful scene ; and, strange as it may appear, it is an acknowledged fact, that these sudden changes seldom affect the health of the inhabitants, or even of strangers..

FOSSILS.

THE Spanish dominions in North America abound with mines of gold and silver, especially the latter, of which precious metal it is said there are no less than a thousand mines in the Mexican empire ; but many of these are not wrought, for want of native Spaniards and negroes. Mr. Coxe affirms, that Louisiana, has copper in abundance, and so fine that it is frequently found on the surface in pieces very pure without melting ; and those who have tried the ore say, that by the common methods it yields above forty per cent. The lead-ore in that country affords sixty per cent. and has been already discovered in quantities more than sufficient for common use. Iron ore is also found plentifully in many places near the surface of the earth, from which a metal is extracted little inferior to steel in goodness. Some mines of quicksilver have likewise been discovered, and our author thinks many more might be found if proper search were made after them. The mineral from whence the quicksilver is obtained is of a scarlet or purple colour, which the natives make no other use of than to paint their faces and bodies with in time of war, or on occasions of festivals and rejoicings. This ore is broken and distilled in earthen pots, the necks whereof are put into others almost full of water, which last are placed in the ground ; and, being thus set in rows almost contiguous, a fire is made over them with small brush-wood, which drives the quicksilver out of the ore into the water. Three or four men will tend some thousands of these pots. The great trouble is in digging ; but

all the expence does not amount to a tenth part of the value of the produce.

To make it appear probable that both gold and silver might be found in Louisiana, Mr. Coxe gives us some accounts he received from persons of credit, and particularly by letters from New Jersey, written by one well skilled in the refining of metals, signifying, that for several years successively a man took a fancy to ramble with the Indians to the other side of the mountains on the back of New York to the country we are speaking of, and always brought home with him a bag, as heavy as he could well carry, of dust, or rather small particles of various sorts of metals, very ponderous. When melted, it appeared to be a mixture of metals, to which at first no denomination could be properly assigned; but by repeated trials they found it contained lead, copper, and when refined, above a third part of silver and gold. Great pains were taken to bring the man to discover where he got this treasure, which served him only to expend on liquor till he went on another expedition; but nothing could prevail upon him to declare any more than this, that, about three hundred leagues southwest of Jersey, at a certain season of the year, there fell great torrents of water from the mountains, and, when they ceased, the Indians washed the sand or earth at some distance below those falls, and at the bottom remained that medley of metals.—Our author farther observes, that there are great quantities of orpiment and sandarach in various parts of this province; and writers on metals and minerals affirm, that, they not only contain gold, but where they are found, they are generally the covering of mines of gold or silver.

As to the gems of Louisiana, all that Mr. Coxe

knows of are amethysts, of which there are some very fine and large : and turquoises, thought to be as fine and large as any in the world. There is also an account of lapis lazuli, which, according to those skilled in mines, is another indication that gold is at no great distance.—But we need say no more of gems or metals in this place, having spoken of them sufficiently, as they occurred in the preceding parts of this work.

Under this head we may take notice of the filtre-stone of Mexico, which is said to grow under water on the rocks in some parts of the gulf of Mexico, and to harden and petrify spontaneously in the air ; but Dr. Vater, who has given some account of it in the Philosophical Transactions, does not take upon him to determine either its origin, or the manner of its growth, both appearing to be very suspicious. It has obtained the name of filtre from its porosity, whereby it lets liquors pass through it ; and for this reason pots and mortars are made from large pieces of it, to strain liquors, particularly water to drink ; for it is thought that water filtrated through this stone is thereby freed from all its impurities, and becomes more wholesome. " This is the reason," says the doctor, " that these stones are highly valued in Japan, and sold at the price of gold ; because the Japanese, who know nothing of the stone or other disorders in the kidneys, and who prefer health far above all other blessings, think the filtration of their drink contributes to the prolonging of life." But, according to Le Clerc and other writers, these tophaceous stones are not confined to Mexico, but dug up in several parts of Europe ; and our author had a choice collection of fossils presented to him by Dr. Ehrlhart, of Memmingen, in which there was a tophus pecu-

liarly porous, found about that city, which would strongly imbibe water, as soon as applied to its surface. However, whether the Mexican filtre be taken out of the sea, or dug out of the earth; Dr. Vater does not pretend to determine, as has been already intimated.

With respect to the virtue ascribed to the Mexican filtre-stone, our author, from several observations and experiments, makes it evident, that no stone-filters are able to depurate water, and separate the saline earthy and mineral impurities therein dissolved: yet he does not deny, but that muddy and slimy waters may by straining through such stones become more clear and pellucid; because these impurities do not dissolve in the water, or intimately incorporate with it, but only float therein. These excepted, no other waters can be made puref, as the doctor learnt from repeated experiments, made both by the filtre of Holland, the topus of hot baths, and common stone, on several kinds of river and spring water; for, having examined their weight before and after filtration, he found little or no difference. "How happy therefore," observes he, "are the countries to which Providence has given limpid and wholesome springs of water, which require no such filtres! But, as for those that are deprived of this blessing, the best they can do is to use rain-water, which by distillation is freed from all its impurities."

We have already in several places taken notice of the extraneous fossils that are found in different parts of the world, and particularly of the bed of oyster-shells near Reading, in Berkshire; but this seems trifling, compared to the accounts we have of the vast quantities of these shells found in Virginia, where for many miles together the earth is

intermixed with them to the depth of several yards. In some places the shells lie closely bedded together, and look like the veins of a rock, of which some are three or four yards thick, and as hard as free-stone. Of these rocks of oyster-shells, which are not so much petrified, they burn and make all their lime; and in the looser banks of shells and earth there are often found perfect teeth petrified, some of which are two or three inches long, and above an inch broad, the part that one may suppose to have grown out of the jaw being polished, and almost as black as jet. The back-bones and ribs of whales (according to Mr. Clayton) have also been dug up many miles distant from the sea.— But this subject having been sufficiently noticed in the preceding parts of this work, we shall not enlarge upon it here. We may add, however, one particular relating to Virginia which is very remarkable, viz. that, from the sea-coast for a hundred miles up into the country, there is scarcely a stone to be seen, except here and there some rocks of iron ore; so that they ride their horses without shoeing them, and, the country and climate being dry, their hoofs are harder than those of our horses in England. Instead of stones they find a clay, of which they make very fine bricks; and it is to be observed, that, at the water-falls from the mountains, there are stones enough of different kinds, fit for paving and other uses. The hills likewise afford quarries of slate and of a kind of free-stone; and they have also a sort of shining pebbles, not unlike kerry-stones, which, though generally soft, are said to harden by the air, and, when polished, are extremely beautiful.

VEGETABLES.

THE ancients seem to have been acquainted with only one species of the aloe, but the researches of modern travellers in Asia, Africa, and America, have occasioned the discovery of at least forty sorts unknown to antiquity ; nay, Mr. Bradley assures us, that he has seen above sixty several kinds in the physic-garden at Amsterdam. Our present design, however, is only to describe the American aloe, which is one of the most curious and remarkable plants of all the numerous species. The aloe plant has very thick green leaves, broad towards the root and tapering to a point, stiff and prickly, and yielding a kind of cotton, of which laces may be made. From the midst of the leaves rises a stem, which bears the flowers and fruit. The flowers grow at the ends of branches that shoot out opposite to each other ; and each consists but of one leaf, cut into six segments at the top like a hyacinth. The fruit is oblong and cylindrical, divided into three cells, in which are contained flat and, for the most part, semicircular seeds. Most of the African sorts produce flowers with us annually, when grown to a sufficient size ; but the American aloe, which most commonly produces its flower-stem immediately from the centre of the plant, seldom flowers till it be of a great age, and this but once during the life of the plant ; so that to have one flower in England is reckoned a curiosity, and generally draws a vast number of spectators. It is observed, that, when the flower-stem, which is usually large and grows to a great height, begins to shoot from the middle of the plant, it draws all the nourishment from the leaves ; so that, as the stem

advances, the leaves decay; and when the flowers are full blown, scarcely any of the leaves remain alive: but, whenever this happens, the old root sends forth numerous off-ssets; and it is only at this time that some of these aloes can be propagated.

Dr. Merret tells us, that he had an American aloe, consisting of eleven leaves, which was tied about with a red dry cloth, and hung up, without oil, in his kitchen. In a whole year he observed it lost two ounces, three drams, and twenty-four grains of its weight. The next year being drier and hotter, it lost upwards of three ounces; and, more than double in the six colder than in the six hotter months. He kept it about five years, and it wasted much in the same proportion, till at last, hanging it in a cold garret, it died. Our author observed, that every year, two of the greater leaves first changed colour and withered, and every spring there succeeded two fresh and green ones, of the size of the preceding; from whence he thinks it may be probably inferred, that there is a circulation of the nutritious juice in this plant; for how is it possible that the roots, continuing firm and solid as at first, should supply so much nourishment, unless the said juice returned from the old decayed leaves into the root, and so produced new ones?

It is proper to observe, that of all the species of aloes, there are not above twelve that yield the inspissated juice of the same name, which is obtained by cutting the leaves of the plant, from whence it oozes either spontaneously or by pressing, and is exposed to the sun till it becomes of a proper consistence. There are three sorts of aloes, the succotrine which is the purest; the hepatic, which is somewhat coarser and harder; and

the cabaline or horse-aloes, which is the most impure, blackest and strongest of all, and is of little use but for horses and cattle. Whether these are all procured from the same plant, or from different species of it, authors are not rightly agreed.—The best aloes is that which is pinguious, of a dark colour, in some measure friable, its smell resembling that of myrrh, and which when pounded yields a powder of a golden colour. In consequence of its bitterness, it is called the gall of nature; and this makes it so nauseous, that it is rarely used in liquid forms, but made up into pills. It consists of two substances, one resinous, which may be extracted by spirit of wine; the other of a gummy nature, which may be dissolved in water. Its balsamic quality is so great, that animalcules may be preserved in it for ages; and upon this account it is used in embalming human bodies. Its cathartic virtue is best employed in watery cold constitutions, and such as are disposed to the generation of acids. The succotrine aloes is preferable for internal uses, and the hepatic for external.

Amongst the vegetables of America, one of the first we ought to mention is the celebrated plant we call tobacco, which is now grown into such general use in Europe, and makes one of the most profitable branches of the English commerce. The Virginia tobacco, especially the sweet-scented, which grows on York River, is reckoned the best in the world, and is generally vended in England for home consumption; but the hotter sorts, either of Virginia or Maryland, turn to as good account, being demanded in Holland, Denmark, Sweden, and Germany. Mr. Clayton says, that the sweet-scented tobacco, which grows on sandy land, is

best for smoking whilst new, or only two or three years old; but, if the stiff land tobacco, which is generally of a good substance, be kept five or six years, it will much exceed the former.

The manner of planting and ordering tobacco is this: The seed is first sown in beds of fine mould, and, when the plants are risen to a convenient height, they are transplanted to little hills, three or four feet from each other, somewhat in the manner of hep-grounds. This is done about the beginning of May, from which time the hills, are kept continual'y weeded, and, when the plants have put forth such a number of leaves as they think the soil will nourish to a sufficient substance and largeness, they take off the top of each plant, which after that grows no higher. If the ground be rich, they let a plant put forth twelve or fifteen leaves before they top it; if poor, not above nine or ten; and so in proportion to the goodness of the soil. The suckers which the plant puts forth between the leaves are taken off once a week till it comes to perfection, which it does in August. Then in dry weather, when there is a gentle breeze of wind, they cut down what is ripe, letting it lie three or four hours on the ground; after which they carry it on their shoulders to the tobacco-houses, or sheds, where a peg is driven into the stalk of each plant; and by these pegs the plants are hung up to dry, so near each other that they just touch. Thus they let them hang for five or six weeks, till such time as the stem in the middle of the leaf will break in bending it; and, when the air has so moistened the leaves that they may be handled without breaking, they strip them off the stalks, tie them in little bundles, and pack them up in hogsheads for exportation. The

bundles designed for twist-tobacco are steeped in sea-water, or, for want of that, in common water, then twisted in the manner of ropes, and the twists formed into rolls by winding them with a kind of mill round a stick; and in this condition they are imported into Europe.

Sometimes the planters are obliged to plant their hills twice or thrice over, on account of an earth-worm which eats the root; and, when the plants are well grown, they often suffer damage by another worm called a horn-worm, which is bred upon the leaves, and if not carefully taken off, will spoil a whole crop. The plants, when young, are also sometimes destroyed by a small fly, which breeds upon them in gleamy weather; and they are likewise subject to a distemper they call firing, which happens when very hot weather suddenly follows a wet and cold season, at which time the leaves of the young plants turn brown and are dried to powder. Another fault is when the leaves do not spread and grow large, but rather spire upwards and grow tall; and such plants as these they call Frenchmen.

Tobacco is narcotic, emetic, and cathartic to such a degree, that the internal use of it is seldom or never to be allowed, though a water distilled from the green leaves is much recommended for dissolving stones in the urinary passages. Some people use an infusion of tobacco as an emetic; but it is a dangerous and unjustifiable practice, as it is apt to produce violent vomitings, sickness, and stupidity. A strong decoction of the stalks, with sharp pointed dock and alum, is reckoned of good service, used externally, in cutaneous distempers, for which purpose some boil them in urine; and the same is said to be an infallible re-

medy for the mange in dogs. The juice of tobacco is recommended to preserve the teeth and gums, and to cure the tooth-ach ; for which last purpose the chymical oil of tobacco, dropped on lint and applied to the tooth, has been of service ; but people should be very cautious how they use this oil, which is so strong, that a drop or two of it put on the tongue of a cat produces violent convulsions, and death itself in the space of a minute.

Among the shrubs of California is one called pitahaya, which is said to be peculiar to that peninsula ; its branches are finely fluted, and rise vertically from the stem, so as to form a very beautiful top ; yet it bears no leaves, the fruit growing on the boughs, without shade or cover. It resembles a horse chesnut, but contains a pulp, which has some resemblance to that of a fig : in some it is white, in others yellow, and sometimes red ; but always exquisitely delicious, being a rich sweet, tempered with a grateful acid. This peninsula has likewise most of the fruits to be found in other parts of America.

Another very remarkable vegetable of North America is the poison-wood-tree, which grows in New England in swamps or low wet grounds, and is described by Mr. Dudley as like a sumach, which it exactly resembles in its twigs, leaves, and shape, so that some call it the swamp sumach ; and it likewise bears a dry berry. It never grows bigger than about the thickness of a man's leg, and as tall as an alder ; but it spreads considerably, and several grow together, especially about the roots of one that has been cut down. The inside of the wood is yellow, and very full of juice, which is as glutinous as honey or turpen-

tine, and smells extremely fetid ; and the wood itself has a very strong disagreeable smell.—As to its poisonous quality, our author observes, that it poisons two ways, either by the touch or by the smell; the scent of it, when cut down in the woods, or burning in the fire, being poisonous to a great degree. One of Mr. Dudley's neighbours was blind for above a week with only handling it ; and a gentleman, sitting by his fireside in the winter, was swelled for several days with the smoke of some of this wood that happened to be in the fire. But, what is strange, it has this effect only on some particular persons and constitutions, for Mr. Dudley has seen his own brother not only handle it, but chew it without any harm at all ; and so by the same fire one has been poisoned, and another not in the least affected. However, this sort of poison is never mortal, but will go off in a few days of itself ; though generally the patient applies plantain-water, or salad-oil and cream. A few hours after a person is poisoned, he feels an itching pain, which is soon followed by an inflammation and swelling. The wood is as cold as ice, as Mr. Dudley's neighbour that was poisoned told him, so that he plainly perceived it differed from the other wood he was throwing up into his cart ; and he assured him he could distinguish it blindfold, or in the dark, from any other wood, by its excessive coldness.

As we are now speaking of New England, it seems proper to add some other observations of Mr. Dudley on the vegetables of that country, and particularly on the Indian corn or maize, which is the most prolific grain they have, commonly producing twelve hundred grains from one,

and often two thousand. "But the fairest computation," says our author, "is this: Six quarts of this grain will plant an acre of ground, and it is not unusual for an acre of good ground to produce fifty bushels of corn."

The fecundity of various plants is very surprising. We have an account in the Philosophical Transactions of a single plant of barley, that by steeping and watering it with salt-petre dissolved in water, produced two hundred and forty-nine stalks and eighteen thousand grains. In this case, indeed, art and force were made use of, but we have remarkable instances of this kind, effected by unassisted nature, particularly that of a pom-pion-seed, attested by Mr. Edwards of Windsor. This seed, in the year 1699, was accidentally dropped in a small pasture, where cattle had been foddered for some time; and taking root of itself, without any manner of care, the vine ran along over several fences, and spread over a large piece of ground far and wide, continuing its progress till it was killed by the frost. The seed produced no more than one stalk, but it was a very large one, being eight inches round; and from this single vine they gathered two hundred and fifty pom-pions, one with another as big as a half peck, besides a considerable number of small ones, not ripe, which they left upon the vine. Add to this what M. Dodart observes, who has an express discourse on the fecundity of plants in the memoirs of the Academy of Sciences, wherein he shows, that an elm, at a moderate computation, yields one year with another three hundred and twenty-nine thousand grains or seeds; each of which, if properly planted, would grow up to a tree. Now an elm ordinarily lives a hundred

years, and consequently, in the course of its life, produces near thirty-three millions of grains, all coming originally from one single seed. But instances of this fecundity need not be multiplied, being obvious to every one's observation, who has paid the least regard to the wonders of nature.

Indian corn is very remarkable on account of its variety of colours, as blue, white, black, red, yellow, greenish, speckled, striped, &c. and, it is a singular fact, that if any one sort be planted separately, so that no other sort be near it, it will retain its own colour; but if in the same field you plant the blue corn in one row of hills (as they are called) and the white or yellow in the next row, they will mix and interchange colours; that is, some of the ears in the blue corn rows shall be white or yellow, and some in the white or yellow rows shall be blue. The little hills of Indian corn are generally four or five feet asunder, and continued regularly in straight lines, something in the manner of a hop-ground; and yet this mixing and interchanging of colours has been observed when the rows of hills have been several yards distant from each other: Mr. Dudley was even assured that this interchange has been made at the distance of four or five rods, and particularly in a place where there was a broad ditch of water between the two different sorts of grain; so that the mixture cannot be owing to the roots and small fibres reaching to and communicating with each other, as some have imagined. Our author, therefore, is of opinion, that the stamina or principles of this surprising conmixture of colours are conveyed by the wind, and that the season of it is when the corn is earing, and while the milk is in

the grain.; for at that time it is in a sort of estuation, and emits a strong scent. What confirms this hypothesis, of the air being the medium. of this communication of colours in the corn, is an observation of one, of Mr. Dudley's neighbours, viz. that a close high fence of boards between two fields of corn, that were of a different colour, entirely prevented any mixture or alteration.

Mr. Winthrop describes the ear of the Indian corn as generally about a span long, consisting of several rows of grain commonly eight or more, according to the goodness of the soil, and each row containing above thirty grains. The white and yellow sorts are the most common; but he observes, that, not only in the same field, but even in the same ear, the grains are sometimes of different colours. The ear is clothed and armed with several strong husks, which not only defend it from unseasonable rains, and from the night-colds, (it being the latter end of September before it is fully ripe in some parts) but also from crows, starlings, and other birds. Its stalk grows to the height of six or eight feet, more or less, according to the condition of the soil, or the kind of the seed.

The maize of Virginia grows taller than that of New England, and there is a sort used by the northern Indians farther up the country, which is much shorter. It is always jointed like a cane, is full of a sweet juice, and at every joint grow long leaves almost like flags, and at top a bunch of flowers like the blossom of rye. The manner of planting this Indian wheat is in rows at equal distances every way, as has been already mentioned; and, when the corn is grown up to a proper height, they cut up the weeds and loosen the earth about it with a broad hoe, repeating this labour

as often as the growth of the weeds makes it necessary. When the stalk begins to grow high; they draw a little earth about it; and, upon the putting forth of the ear, they scrape up as much as will make a little hill like a hop-hill; after which they give themselves no farther trouble about it till harvest. This culture is all done with the hoe, but the Europeans have now taken a better way of planting. With the plough they make single furrows through the whole field at the distance of six feet, or as they see convenient; and to these they make cross furrows at the same distance. Where these furrows intersect each other, they throw in the corn, and cover it either with the hoe, or by running another furrow with the plough. When the weeds begin to over-top the corn, they plough the rest of the field between the planted furrows, and so turn in the weeds. This is repeated when they begin to hill the corn with the hoe, and thus the ground is loosened, and the roots have liberty to spread. The husks that grow about the ear of this corn the Indian women slit into narrow slips, and weave them curiously into baskets of several fashions.

Among the numerous vegetables of New England, Mr. Dudley mentions a *platanus* or button-wood-tree, as it is there called, which was nine yards round, and held that bigness a great way up; and this tree, when cut down, made twenty-two cords of wood, as our author was informed. This tree he often propagated by cutting of sticks five or six feet long, and setting them a foot deep in the ground in the spring of the year, when the season is wet; and this and the locust-tree are remarkable for their quick and easy growth. A seed of the latter, blown off into our author's gar-

den, took root of itself, and in less than two years, rose to the height of six feet.

With regard to their fruit trees Mr. Dudley observes, that their peach-trees are all standards, and he himself has had in his own garden seven or eight hundred fine peaches growing at the same time upon one tree; to which we may add, that in several of the plantations they have such vast quantities of peaches, that they beat them off the trees and give them to their hogs. These trees raised from the stone will bear in three years, and our author had one in his garden of twelve years growth, that measured two feet one inch round, a yard from the ground, and two years before bore nearly two bushels of fine peaches.

The people of New England, says the same gentleman, have of late years run so much upon orchards, that in a village near Boston, consisting of about forty families, they made, in the year 1721, near three thousand barrels of cyder; and in another town of two hundred families, in the same year, they made near ten thousand barrels. Some of their apple-trees will yield six, some seven barrels of cyder at the rate of eight or nine bushels of apples to the barrel; but this is not very common. Mr. Dudley has seen a fine pear-main-tree, which at a foot from the ground, measured ten feet four inches round, and in one year bore thirty-eight bushels of excellent fruit. The largest apple-tree he found in that country was ten feet and a half in compass.

The orange pear-tree according to our author, grows the largest, and yields the fairest fruit. He observed one of these trees near forty feet high, which was six feet six inches in circumference, a yard from the ground, and bore thirty bushels at a

time; and he himself had a pear-tree that was five feet six inches round. One of his neighbours had a Bergamot pear-tree, brought from England in a box about the year 1643, which was six feet in compass, and in one year bore twenty-two bushels of fine pears.

The same gentleman gives us a remarkable instance of an apple-tree in an orchard, which bore a considerable quantity of apples, especially every other year, and yet never had a blossom. For three years he went in the proper season and observed it; and, when all the rest of the orchard was in bloom, he could not see one single blossom upon this tree. Not contented with once going, he went again and again, till he found the young apples perfectly formed. One year he took notice of it early, not knowing but it might blow sooner than the other trees; but he found no blossoms: And the owner, with several of his neighbours, assured Mr. Dudley they had known the tree upwards of forty years, and that it never had any blossom. Our author opened several of the apples, and found very few seeds in them, some of which were lodged singly in the side of the apple.

Mr. Glover, who has given some account of Virginia in the Philosophical Transactions, observes that fruit-trees are very numerous in that country; insomuch that there are few planters without their orchards, some containing twelve hundred trees and upwards, bearing all sorts of English apples, as pearmain, pippins, russetins, marigolds, king's apples, batchelors, &c. of which they make a great deal of cyder. They have also great quantities of peaches, with which they feed their swine, and quinces in abundance, both larger and fairer than the English, and not so harsh in taste. They

make a drink of the juice of quinces; and they have also apricots, and some sorts of English plumbs, but these do not ripen so kindly as in England. The few pears they have are large and pleasant, and figs grow there as good as in Spain; but it is remarkable that neither oranges nor lemons will thrive there, though they will in more northerly countries. Cherries are as plentiful all over Virginia as they are in Kent, and the trees are generally larger than in England; and bear more plentifully, without digging about them, or pruning. The woods abound in vines, which twine about the oaks and poplars, and run up to the tops. These bear a kind of red grapes, the wine whereof is smaller than French claret; but it is probable, that, if some of them were planted in convenient vineyards, where they might be better exposed to the influence of the sun, and carefully kept and pruned, they would produce as good grapes as the claret-grapes of France. There is also in the woods a little shrub with a berry like that of our elder, which has a very pleasant taste; and likewise a tree called chincopin, which bears a nut resembling a chesnut, with a rough husk, but much smaller.

On the sides of the hills in Virginia grows plentifully a species of asarum, or black snake weed, the roots whereof are brought over among the true serpentaria Virginiana, and are promiscuously used with them. Soldanella, or sea scurvy-grass, is found in great plenty on the side of the bay. This herb, being excellently calculated for discharging water, contributes very much to the cure of dropsies and scurvies; and it is likewise used in rheumatic cases. It works very roughly, and much disorders the stomach.—There grows like-

wise in Virginia a herb called dittany by some, and by others pepperwort. It rises to the height of twelve or eighteen inches; its leaves are very small and shaped like a heart, which shoot out of the stalk and branches directly opposite to each other; and it smells hot; and bites the tongue like pepper. The distilled water of this herb is an excellent remedy against worms, and an ounce of it is sufficient to provoke a profuse perspiration.— Here are also found two roots, supposed by the physicians to be turbith and mechoacan, both strong cathartics. Turbith purges tough serous humours from the remote parts, and is therefore of service in the dropsy, gout and rheumatism. The root of mechoacan is used to carry off pituitous, serous, and aqueous humours from all parts of the body, especially from the breast, and the head and nervous system. That is to be chosen which is recent, white, and ponderous.

Our author takes notice of another medicinal plant about a foot and a half or two feet high, whose leaves are rugged like those of borage, but longer, and its berries when ripe are yellow. The English call it the fever or ague-root, from its service in those distempers. A dram and a half of this root newly taken out of the ground, and infused in beer and water for twelve hours, operates with great violence; but a dram of it in powder only excites a moderate perspiration. Its taste is a little bitter, and therefore somewhat hot.

In speaking of the medicinal vegetables of America we must not omit sassafras, which is a yellow wood, of a brisk aromatic scent, the produce of a tree, whereof there are vast numbers in Florida, and also in Virginia and the other united provinces. The natives of Florida call it pahaniwe, and

amongst us it has obtained the name of fennel-wood, its smell somewhat resembling that of fennel. It is principally of use in removing obstructions and strengthening the internal parts. It is reckoned a sovereign remedy for catarrhs, and is esteemed in the gout, sciatica, &c The best sassafras is that covered with the thickest bark, reddish and rough, of a sharp taste, and strong aromatic smell.

In New Spain, and several other parts of America, grow those seeds we call vanellos, or banillas, which are used as an ingredient in chocolate, to which they give a pleasant flavour; and they are also used to perfume snuff and tobacco. We do not find that they enter into any medicinal composition, though Hernandez says they are grateful to the stomach and brain, expel wind, resist poison, and cure the bites of venomous animals.

Upon the bark of a certain tree growing in Nova Scotia, and the more easterly parts of New England, Mr. Winthrop says there are little knobs containing a liquid matter like turpentine, of a very healing nature. The same gentleman mentions a vegetable called silk-grass, whose pods are full of a sort of fine cotton, which is used in stuffing pillows and cushions. At the bottom of some of the leaves, there is a hollow knob, breeding a small fly somewhat like an ant.

The tulip tree is a native of most parts of America, and is too curious to be passed over in silence.—It rises with a large upright trunk, branching forty or fifty feet high, and covered with a grey bark. The branches of the two-years-old wood are smooth and brown; while the bark of the summer's shoots is smoother and shining, and of a bluish colour. The young wood is green, pithy, and when

broken emits a strong scent. The leaves, which grow irregularly on the branches, are of a particular structure, being composed of three lobes, the middlemost of which is shortened in such a manner, that it appears as if it had been cut off, and hollowed at the middle : the others are rounded off, and are of two colours, their upper surface being smooth, and of a stronger green than the lower. They fall off early in autumn ; and the buds for the next year's shoots soon afterward begin to swell and become dilated, so that, by the end of December, those at the ends of the branches will become nearly an inch long, and half an inch broad.—The flowers are produced at the ends of the branches and nearly resemble the tulip, which has occasioned the name of the *tulip tree*. The number of petals of which each is composed, like those of the tulip, is six ; and these are prettily spotted with green, red, white, and yellow. The flowers are succeeded by large cones.

In those parts of America where it grows naturally, the tulip tree affords excellent timber for many uses ; particularly the trunk is frequently hollowed, and made into a canoe sufficient to carry several people ; and for this purpose the inhabitants think no tree more proper.—This tree is cultivated with tolerable success in many parts of Europe, and when the seeds are good, its propagation is very easy.

WE cannot begin this article more properly than with the moose-deer, which is thought to be

peculiar to North America, and is one of the noblest creatures of the forest. These animals are found no where in greater numbers than in New England, and Mr. Dudley informs us there are two sorts of them, viz. the common light-grey moose, and the large or black moose. The former, which the Indians call wampoose, are somewhat like the ordinary deer, spring like them, and herd sometimes to the number of thirty together. The black moose, whose hair is dark-grey, is shaped much like the common deer, parts the hoof, chews the cud, and has no gall. His ears are large and erect, and he has a very short bob-tail. These deer are less gregarious, not above four or five being found together. The hunters in New England have sometimes taken a buck or stag-moose of the black kind, ten feet and a-half in height from the withers, and a quarter of this venison has weighed upwards of two hundred pounds. A black moose doe or hind of the fourth year was killed within two miles of Boston, which from the nose to the tail measured between ten and eleven feet, and was six feet eleven inches high.

The horns of the moose, when full grown, are between four and five feet from the head to the tip, each horn having seven shoots or branches, and they generally spread about six feet. When the horns, which are shed every year, first come out of the head, they are round like those of an ox, but about a foot from the head they begin to grow a palm broad, and higher up still broader, so that the Indians make ladles of them that will hold a pint. When a moose goes through a thicket, or under the boughs of trees, he lays his horns back on his neck, not only that he may make his way

the easier, but to prevent his being scratched or hurt by the wood. A moose does not spring, or rise in going, as a common deer, but rather pushes along side-ways; and when he is unharboured, he will run a course of twenty or thirty miles before he turns about or comes to a bay. He is not so swift as the common deer, but will run longer; and, when chased, he usually takes to the water. One of these large black mooses has been seen, in his common walking, to step over a gate five feet high.

The flesh of the moose is excellent food, and, though it be not so delicious as common venison, it is more substantial, and will bear salting. The nose of the animal in particular is reckoned a great dainty; and Mr. Dudley who ate several of them, says he found them to be as rich as marrow. The skin of the moose well dressed makes excellent buff, and the Indians make their shoes of it for travelling in the snow. Their way of dressing it is this: After they have haired and grained the hide, they make a lather of the moose's brains in warm water; and, after soaking the hide for some time, they stretch and supple it. Nor are the flesh and skin of the black moose the only parts of it that are serviceable, for even the hair on the ridge of the back, which is ten or twelve inches long, is made into good belts by the Indians.—A moose generally brings forth two young ones, which it is said to do standing, and the young fall from the dam upon their feet.

These creatures, being very tall, and having short necks, do not graze on the ground like the common deer, horses, cows, &c. and, if at any time they eat grass, it is the top of that which grows very tall, or on the side of a rising ground,

In summer they feed on plants, herbs, and young shrubs that grow on the land, but are most fond of water-plants, especially a sort of wild coltstoot and lilly, which abounds in ponds and by the sides of the rivers. For this food they will wade far and deep, and it is by the noise they make in the water that the hunters often discover them. In the winter they live by browszing the tops of bushes and young trees; and, being very strong, as well as tall, they will bend down a tree as thick as a man's leg. When the browze fails them they will eat off the bark of some sort of trees as high as they can reach. They generally feed in the night, and lie still in the day.

To this account of the American moose-deer it may be proper to add an observation of Dr. Molynieux in the Philosophical Transactions, who there describes a large pair of deer's horns dug up in Ireland, which from the tip of the one to that of the other were ten feet ten inches wide. These horns he doubts not belonged to a moose; and, from the number of them found in several parts of Ireland, he concludes that these majestic deer were formerly as frequent in that country, as they are now in New England, Maryland, and Virginia.

The Mexican musk hog, so called from its scent, is a very remarkable animal, found not only in New Spain, but in several other parts of the American continent. Dr. Tyson had one which he had the curiosity to dissect, and he describes it as much less than our common hogs; for, from the end of the body where the tail should be, to the top of the head between the ears, it measured only two feet two inches, and from thence to the extremity of the snout eleven inches. The compass of the body was two feet, that of the neck sixteen

inches ; of the head in the largest place eighteen inches ; and of the snout twelve inches ; for the lower jaw was more protuberant, and the head less tapering than in our swine. Its body was of a grizzly colour, and beset with bristles, which were thicker than those of a hog, but resembling the quills of a porcupine, and variegated with rings of black and white. The belly was almost bare, and the bristles on the sides were short, but gradually increased in length as they approached the ridge of the back, where some were five inches long. On the head between the ears there was a large tuft of these bristles, which were mostly black. The ears were about two inches and a half long, and the eyes, like those of pigs, were small. The snout was like that of a hog, but the mouth small ; and one side of the lower lip was made smooth by the rubbing of the tusk in the upper jaw. The feet and claws were perfectly like those of common hogs. It had no tail, but its greatest peculiarity, and what distinguishes it from any other animal, is the navel or rather foramen on the hinder part of the back.

These animals are usually found in the woods and mountains, and go in herds together. They feed on roots, and fruits ; but as the greatest dainty they hunt after all manner of serpents and toads, and, having caught them, they hold them with their fore feet, and with a great deal of dexterity strip off the skin with their teeth from the head to the tail, and then greedily devour them. As an antidote against the poison, they are said to eat the bark of a certain tree ; and by this sort of food they thrive and become fat. They are naturally very fierce ; and, if one of them be wounded, he presently gets to his assistance a great number of his

kind, and never desists till he has revenged the injury. -

They are always at enmity with the tygers, and oftentimes the body of a tyger and several of these hogs are found dead together. If they perceive a man, they will attack him fiercely, and his best refuge is to get up a tree, which they will assault most furiously with their teeth ; nor will they easily leave him till they are called off by hunger. When they are hunted they often tear the dogs to pieces. Their flesh is esteemed very good, and is highly valued by the natives.

The peculiarity above-mentioned, called the navel, seems to require a little closer observation. It is situated just on the ridge of the back over the hinder legs, and is so covered by the long bristles there, that it cannot be seen without separating them, and then appears a small space almost bare, only beset with fewer, shorter, and finer hairs. In the middle of it is the orifice of the gland, by which it discharges itself of the liquor it separates ; and this orifice has its lips a little reflected and protuberant above the surface of the skin. Dr. Tyson found it would easily admit of a large probe, which could be turned into several parts of the gland ; and, upon a gentle pressure with the fingers, it emitted a small quantity of a yellowish juice, which yielded a very agreeable scent, much like that of musk or civet. This gland is of the conglomerate kind, consisting of several other minute glands. It has no considerable cavity within it, but has several excretory ducts, which, terminating at last in one, discharges its secreted juice by a common orifice. This orifice, having some resemblance to a navel, has imposed upon almost every author that has written on this animal, so far that they have taken it for a real na-

vel; and others, who have not fallen into this sentiment, have proposed conjectures about it full as absurd and extravagant; but there is nothing, according to Dr. Tyson, to which it can be more fitly compared than to the scent-bags in other animals.

We have already given some account of the beaver, and of its bags or purses containing a liquid matter called castoreum, of considerable use in medicine*; but there are some other surprising particulars related of these animals, which we promised to take notice of when we came to Canada, which country abounds with them more than any other part of the world. In the memoirs of the Royal Academy of Sciences there is an extract of a letter from M. Sarrasin, formerly the French king's physician in Canada, concerning the dissection of a beaver. He says the largest are three or four feet long, and about twelve or fifteen inches broad in the chest and haunches; that they commonly weigh about fifty pounds; and that they usually live to the age of twenty years: but Francis says, they live thirty or forty years, and that he had heard of a tame one being kept seventy-eight years. Dr. Sarrasin says farther, that a great way north the beavers are very black, though there are some white; but those of Canada are commonly brown, and their colour grows lighter as they are found in more southern countries.

These creatures observe a wonderful polity, and their manner of living and building their habitations shows an extraordinary instinct implanted in them by the great Author of nature. In order to raise themselves a convenient abode, they chuse a

* See Vol. III. page 80.

low level ground, watered with a small rivulet; where, by making dams across it, they can form a reservoir of water and overflow the ground. These dams or causeys are formed by thrusting stakes five, or six feet long, and as thick as a man's arm, deep into the earth; and these they wattle across with tender pliable boughs, and fill up the spaces, with clay, making a slope on the side against which the water presses, and leaving the other perpendicular. One of these dikes may be ten or twelve feet thick at the foundation, and they raise it in height proportionably to the water's elevation. As they are sensible that materials for building are not so easily transported by land as by water, they take the opportunity of swimming, whenever they can, with clay placed on their tails, and stakes of wood between their teeth, to every place where those materials are wanted. If the violence of the water, or the footsteps of the hunters who pass over the work, should damage it in any degree, they immediately visit all the edifice, and with indefatigable application repair and adjust whatever they find out of order: but, if they are too frequently disturbed by the hunters, they only work in the night, or else discontinue their labours.

When the beavers have completed their causey or dike, they begin to form their cells, which are round or oval apartments, divided into three partitions or stories, raised one above another. The first is sunk below the level of the dike, and is generally full of water; the other two are formed above it. The walls of these house are upright, and about two feet thick; and they are always built in stories, that in case the water rises, the beavers may retire to a higher situation. The materials are the same as they use for the dike;

and, as their teeth supply the place of saws, they cut off all projections that shoot out from the stakes, beyond the perpendicular of the wall : after which they work up a mixture of clay and dry grass into a kind of mortar, and by means of their tails lay it over the building both within and without. They likewise drive stakes into the earth to fortify the structure against the winds and water ; and at the bottom they strike out two openings to the stream, one of which leads to the place where they bathe, and the other is a passage to that quarter where they carry out every thing that would rot or defile the upper apartments. There is a third aperture much higher, calculated to prevent their being shut up when the ice has closed the openings into the lower lodgments.

The dimensions of these houses are proportioned to the number of the intended inhabitants, twelve feet in length and ten in breadth being found sufficient for eight or ten beavers ; and, if the number increases, they enlarge the building accordingly. It has been asserted, that there have been found above four hundred of these creatures in different apartments communicating with one another ; but these populous societies are very rare, because they are two unmanageable, and the beavers are generally better acquainted with their own interests. They associate to the number of ten or twelve, and sometimes a few more, and so pass the winter together in a very agreeable manner.

There are some beavers called terriers, which burrow in the earth, beginning their hole at such a depth under water as they are sensible it will not freeze at ; and this they carry on for five or six feet, just large enough for them to creep through. Then they make a bathing-place three or four feet square,

from whence they continue the burrow, always ascending by stories, that they may lodge dry as the water rises. Some of these burrows have been found to be a hundred feet in length.—This is Dr. Sarrasin's account of the terriers, but others say they begin their burrow on the land, and having dug downwards to a proper depth, they then dig horizontally till they come to the water.

The beavers of Canada have generally completed all their works in August or September, after which they furnish themselves with provisions for the winter. During the summer they regale themselves with all the fruits, plants, and roots, the country produces; but against winter they lay up a stock of wood, which they feed upon after steeping it in water, and this in quantities proportionable to their necessary consumption. They gnaw off twigs and branches from the trees, of which the large ones are conveyed to the magazine by several beavers, and the smaller by a single one; and it is observed that they take different ways, each having his walk assigned him, that they may not interrupt one another in their labour. The dimensions of their pile of wood are regulated in proportion to their numbers, and we are told that one of twenty-five or thirty feet square, and eight or ten feet high, is the usual provision for eight or ten beavers. When the wood is soaked in water, they gnaw it into small pieces, and convey it to their cells, where it is regularly divided amongst them. Sometimes they wander about in the woods, and regale themselves and their young with a fresh collation: for they love green wood better than that which is old and withered: and the hunters, sensible of this, place a parcel of the former about their habitations, and then have se-

veral devices to ensnare them. When the winter is severe, and the water frozen over, the hunters sometimes break the ice; and, when the beavers come to the opening for the benefit of the fresh air, they kill them with hatchets; or else they cover the aperture with a strong net, and then overturn their lodge, upon which the poor animals, thinking to escape by betaking themselves to the water, and emerging at the hole in the ice, fall into the snare and are taken.—Many other things are related concerning the sagacity and industry of these creatures, the strength and beauty of their little cities, of the wars which one canton wages against another, and of their putting the most laborious part of their work upon those they take prisoners, &c.

There is another animal common in several parts of America, called a musk-rat; which is exactly shaped like our water-rat, only somewhat larger. These creatures build houses as the beavers do, in marshes by the water-side, with two or three ways to them; and the inside of them is neatly plastered. They consist of three stories; so that the rats ascend from one into the other as the water rises. In short, they are in all respects beavers in miniature, and therefore any farther account of them is unnecessary.

In North America are several kinds of squirrels; particularly one called the ground-squirrel, which is little larger than a mouse, and is finely spotted like a young fawn. It is a sort of dormouse, only different in colour.—Those called fox-squirrels, which are much larger than the English squirrels, are very numerous in Virginia. They are almost as grey as a common rabbet, and are reckoned as good food.—But one of the greatest curiosities of

Virginia, though it cannot be said to be peculiar to that country, is the flying-squirrel, so called from its being provided with a skin that can be expanded from each side like a sail, and greatly assists it in leaping from one bough to another; insomuch that, though it is smaller than the fox-squirrel, and even than the least of our squirrels in England, it can jump much farther. M. Klein tells us, that in the year 1727 two of these flying squirrels were brought alive to Warsaw, and presented to Augustus II. king of Poland. The king's physician examined one of them when dead, and caused its expanded body to be delineated. In the year 1728 M. Klein had one of these squirrels given him, which was taken in the woods on the confines of Russia, and was much less than the common squirrel. Its skin was very soft, of a beautiful dark-grey colour, and its eyes were large, black, and prominent. It had small ears and very sharp teeth; but though most of them are very mischievous, this was tolerably gentle, and would not bite, unless it was provoked. It was usually fed with bread baked without salt, but the fresh tops of birch were its favourite food. This little creature made its bed in an elegant manner of the moss of the birch, in which it would lie buried as it were, and not stir from thence in the day time, unless disturbed or thirsty. As to the membrane which may be called its flying instrument, it might be expanded from each side about the breadth of a palm, and adhered to the bending of the hinder feet, but was connected with the fore feet by a boney articulation. Upon the whole, M. Klein concludes, that this animal does not properly fly *, but that it can leap from

* Such animals are properly called flying as roam about freely in the air, and not such as only leap with agility.

place to place with greater ease than other squirrels, and by means of its sails continue longer in the air.

The consideration of the flying squirrel naturally leads us to take a view of some of the feathered race, whom nature has furnished with wings that enable them to expatiate in the air ; that is, to fly, in the true and proper meaning of the word. Of all this tribe there is none more deservedly admired than that curious and beautiful little animal called the humming-bird, of which there are several species to be met with in most parts of the American continent, as well as in many of its islands. The smallest sort of humming-bird is considerably less than a wren ; and, according to all accounts, it is the least bird in the world. Mr. Hemesly (in the Philosophical Transactions) tells us, that the leg and foot together are but half an inch, and the whole body not quite an inch in length. Upon weighing one as soon as it was killed, it was found to be only the tenth part of an ounce avoirdupoise, which is much about the weight of a sixpence ; whereas a titmouse, the smallest bird in England, weighed above two shillings. The same gentleman tells us, that its eggs are about the bigness of a pea ; and Mr. Winthrop, who weighed two of them, found one to be about five grains, and the other only three and a

from one tree to another. Nay, it has been much doubted by some, whether there is any such thing in nature as a flying quadruped ; but the common bats put the matter out of dispute, to say nothing of the dracunculi preserved in several museums.—Something like the flying squirrel, or perhaps the same, is the *felis volans* or flying cat of Scaliger ; and of the same nature, but larger, is the *vespertilio admirabilis* or the wonderful bat of Brontius.

half. As to its colours, they are various and surprisingly beautiful; though the bird is differently described by different authors. De Laet represents it as having all the colours of the rainbow, the belly and the ends of the wings being of a golden colour, the sides green as an emerald, with a green tuft of feathers on its crown, a circle round its neck as red as a carbuncle, the bills and legs black as jet, and the eyes like diamonds. Others have asserted that its colour is like that of a peacock's neck, in that part where the black ground is finely ornamented with a glistening greenish blue; and Mr. Hamersly describes it to be of a shining green colour, somewhat resembling the head of an English drake.—But, though authors differ a little in their descriptions of the humming-bird, all agree that its plumage is extremely beautiful.

It is natural to suppose this little creature obtained its name from the humming noise it makes in its flight, almost like that of a spinning-wheel; occasioned by the swift motion of its wings; and yet Mr. Hamersly says he never observed any such thing. It is a solitary bird, no more than two being seen together at a time, viz. the male and female; and they are easily distinguishable, the former being somewhat larger than the latter. They feed by thrusting their slender bill and tongue into the blossoms of trees and other flowers, from whence like bees, they extract the sweet juices; and this they do upon the wing, hovering over the flower without perching. They can fly very swiftly; and a respectable author tells us he has known one of them give chase to a hawk, though he imagines the diminutive size and agility of the bird were its only protection." Some writers how-

ever represent the humming-bird as formidable to the hawk on account of his sharp bill, which is as fine as a needle, and with which he pierces the sides of his enemy, clinging fast to him with his little talons : but this we apprehend is fabulous..

The nest of the humming-bird is curiously contrived, being made of cotton-wool, in form and bigness like the thumb of a man's glove, and usually built at the extremity of the branches of the tamarind trees. These birds are seldom seen on the ground, but fly about the gardens from one flower to another. They are seen only in summer, and are very difficult to keep alive for want of their natural food ; though Mr. Clayton says they have been kept, and fed, with sugar and water.

The next curiosity among the feathered inhabitants of North America is the mocking-bird, so called from its imitating the notes of all other birds, which, with the many charming ones of its own, makes it accounted the finest singing bird in the world. There are two sorts of them, the grey, and the red, both about the size of a thrush ; but the former is most esteemed, as having the softer note. Its feathers are much of the colour of our grey plovers, with white in the wings like a magpye ; and its postures in flying are very odd ; sometimes with its tail upright and its head down, and sometimes the contrary. It is a brisk bold bird, and yet seems to be of a tender constitution, neither singing in winter, nor in the middle of summer, and with much difficulty are any of them brought to live in England. It sings not only by day, but also at all hours of the night on the tops of chimneys.

In Carolina are five kinds of hawks, the most remarkable of which is named the herring-tailed

hawk, from its beautiful forked tail; and it is also called the snake-hawk, from its feeding on snakes, it managing with great dexterity the largest in those parts. It is of the size of a falcon, but is a much longer bird, of a fine aurora colour, with the pinions of the wings and end of the tail of a jet black. These birds never appear but in summer, and are very familiar. They will fly for hours together, near the place where the snakes are, till they have an opportunity of killing some of them. They seize the formidable reptile in their talons, near the head, flying and dragging it some distance before they tear it in pieces; and then devour it. On account of their destroying the snakes, the planters will not suffer them to be killed.

There are two sorts of Virginian nightingales, or red birds, the one with a tuft on his head, the other quite smooth-feathered. The cocks of both species are of a bright scarlet colour, and the hens of a dusky red.—In the same country is a bird called the blue bird, which is of a beautiful azure colour, and about the bigness of a chaffinch; and here are several sorts of goldfinches, finely variegated with red, orange, and yellow feathers.—There is another bird very injurious to corn, called a black-bird, being as black as a crow, only some of them have scarlet feathers in the pinions of their wings. They seem to be a sort of starlings, for they cry like them, but do not sing, and are much of the same bigness.—The jay of Virginia is less than that of England, and the body of it is blue, whereas ours is brown. Its wings however are curiously marbled, and it has the same cry, and sudden jetting motion.—In the wood-peckers there is great variety; one species of

them is as big as a magpye, with blackish brown feathers, and a large scarlet tuft on the top of the head ; besides which there are four or five sorts more, some with green, yellow, and red heads, and others spotted with red and white in a very beautiful manner.

In Virginia, there are three sorts of eagles, the largest of which is called the grey eagle; being much of the colour of our kite or glead ; the second is the bald eagle, so called because the body and part of the neck and head are only covered with a whitish sort of down ; and the third is the black eagle, much resembling those of our own island. These generally build their nests on the top of some tall old tree, stripped of its boughs, and near the side of a river ; and the people usually fell the tree when they take the young. When the eagle observes that the fishing-hawk has struck a fish, he takes wing immediately, and pursues the hawk ; which chace affords the spectators an agreeable entertainment, for, as soon as the hawk perceives himself pursued, he screams and makes a terrible noise, till at length, in order to save himself, he drops the fish, which the eagle frequently catches before it reaches the earth or water. These eagles kill young lambs, pigs, &c.—The fishing hawk is a species of the king's-fisher, and much resembles that bird in shape and colour, though it is larger, and not quite so curiously feathered.

Several sorts of owls are found in Virginia and other parts of the United States, particularly brown and white owls, which are as large as a goose, and often kill hens and other poultry in the night. The white owl has a delicate plumage, the feathers on the breast and back being white as

snow, and tipped with a jet black.—Here is likewise a large ravenous kind of bird, almost as big as an eagle, called a turkey-bustard, having red gills resembling those of a turkey, from whence it seems to have derived its name. It seems to be a species of the kite, hovering on the wing like that bird, and being carnivorous. Its fat, dissolved into an oil, is much recommended in the sciatica, and any old aches and pains.—Nor must we omit the wild turkeys, which are remarkable for their size, some of them weighing fifty or sixty pounds. Their legs are very long, and they run exceeding swiftly. Their feathers are of a blackish shining colour, resembling those of a dove's neck when viewed in the sun.—Here are also several sorts of herons, one larger than the English, and feathered like a goose; and there is another species which come only in summer, and are milk-white, with beautiful red legs.

Mr. Clayton tells us, that there are several sorts of frogs in Virginia, and one in particular of a prodigious size, being eight or ten times as big as any in England. It makes a noise like the lowing of a bull, or the hollow sound of a bittern. There is another small sort of a frog, says our author, which during the spring makes a noise like pack-horse bells; and a third sort which is green, and will take surprising leaps, on which account it is called the flying frog.

The blowing snake, which is a sort of viper, derives its name from its blowing and distending its head before it bites. Its poison, without a speedy remedy, is mortal; and there is another dangerous kind of snake called the red snake, as being of a dark brown colour inclining to red.

The bellies of these reptiles are of a dusky white, with a streak of red on each side.

The horn-snake is another remarkable species, so called from a horn on its head, with which it gives a wound as mortal as the bite of the rattle-snake.

That called the corn snake, from its being frequently found in corn-fields, is much like the rattle-snake in colour, but the chequers are not so regular, nor is its bite so venomous.

We must now turn our attention to the rattle-snake, an animal found commonly in most of the warm parts of America; and we shall be the more particular on this subject, as it has afforded matter of speculation and wonder to the most curious inspectors into the works of nature. This creature derives its name from certain joints at the end of its tail, which fold over each other somewhat like the tail of a lobster; and on being shook, make a rattling noise. The number of these joints or rattles is uncertain, being more or less according to the age of the snake, as some authors assert, imagining that every year there is the addition of a new rattle. However, they seldom exceed twenty, though Mr. Dudley was told by a man of credit, that he killed a rattle-snake, which had between seventy and eighty rattles, with a sprinkling of grey hairs, like bristles, all over his body; and that it was full five feet six inches long, and as big as the calf of a man's leg. Dr. Derham and others have observed, that Providence has wisely given these rattles to this poisonous serpent, that the noise might be a warning to man and beast to avoid the approaching danger.

The usual length of the rattle-snake is from

three to five feet : Dr. Tyson dissected one four feet five inches long, whose greatest circumference, was six inches and a half, that of the neck three inches, and near the rattle two inches. The top of the head was flat as in the viper*, and by the protuberance of the jaws it somewhat resembled the head of a bearded arrow. At the extremity of it were the nostrils ; and between them and the eyes, but a little lower, were two other orifices, which the doctor took for ears ; but he afterwards found they only led into a bone that had a pretty large cavity, but no perforation. The eye was round, and about a quarter of an inch in diameter, over which there was a large scale jetting out, which seemed to serve it for an eye-lid. The scales on the head were the smallest of any, those on the back the largest, increasing in proportion to the thickest part of the body, and thence diminishing again to the junction of the rattle, all of them in figure somewhat resembling the seed of a parsnip. They were of various colours, those on the head being like the feathers on the back of a green-finch, speckled with black spots, four of which were larger and very remarkable. Those on the back were a dark tilleiot and speckled, forming by this mixture a curious chequer-work ; but as they approached the end of the tail, they became darker, and at last almost black. The scales on the back had an edged rising in the middle; which was still less protuberant nearer the sides,

* Our author, upon the dissection of this snake, found its parts, both external and internal, so much like those of a viper in almost all respects, that he does not scruple to place it in that class ; and from the rattle, which sufficiently distinguishes it from all other serpents, to name *A. c. caudigera.*

where they were flat. The belly was covered with long scales of a yellowish colour, and speckled with black ; but beyond the anus there were some scales of a lead colour, and from them to the rattle were six rows of smaller scales of the same colour. The scales of the belly were joined together by distinct muscles, the lower tendon of each muscle being inserted into the upper edge of the following scale, and the other tendon of the same muscle inserted about the middle of the preceding scale. To each scale a rib was appropriated, whose point was joined with the extremity of it, which must considerably promote the use for which nature designed them, assisting them to perform their reptile motions ; for the scales are indeed so many feet, which, being free and open below, do thereby take hold of the ground. They move quicker on the rocks than on the earth or plains, because there they have firmer footing ; but in soft ground, though their belly be flat, they can alter its figure so as to take the deeper hold, as is observed in a viper. In short, this coat of armour is so curiously contriv'd, that, though it covers the whole body, yet by its frequent jointings it admits the animal to make various motions.

Upon examining the lungs of the rattle-snake, which consist only of one lobe, the fore part whereof is full of numerous vesicles, and the latter an entire large bladder, our author takes occasion to observe, that, in animals where respiration is not so frequent, nature provides a sufficient store-house for the air in such large bladders, whence it is dispensed as the animal œconomy requires it ; for tortoises, vipers, rattle-snakes, toads, &c. which sleep a great part of the year, as previously to this repose they take in their store of food, so perhaps

of air too ; for, whilst they remain thus asleep, and sometimes dead to all appearance, it may be questioned whether they have any motion of those parts which are requisite to draw in fresh air in inspiration : And this seems to be confirmed by the instance of a viper, which remained alive some days after the skin and most of the viscera were separated, and the lungs were not observed all that time to rise or fall, as in inspiration and expiration, but appeared equally extended with air ; only as soon as it died the lungs fell. The stomach of this viper was empty, and so was that of the rattle-snake the doctor dissected, which for four months at least had eaten nothing ; so that, though they can live a long time without food, air being necessary for their subsistence, they are provided with the receptacles above-mentioned.

The head of this snake is small, but the mouth is very large, and its tongue in all respects like that of a viper, and composed of two long round bodies, joined together from the root two thirds of its length. These are darted out and retracted again with great agility. To facilitate its exertion, the under jaw is divided for a considerable space ; for if it were conjoined, as in other animals, and beset with teeth, they would be apt to injure the tongue, or at least it might prove incommodious to the use it is designed for, which is supposed to be the catching of flies, and other small animals it has a mind to devour. Over the tongue lies the larynx, not formed with that variety of cartilages usual in other creatures, but having a sort of slit for receiving and discharging the air, which, passing only through such a slit, without other organs to modulate it, causes the

hissing sound emitted by the rattle-snake and other serpents.

The teeth are of two sorts; first, the lesser, which are seated in each jaw, and serve the rattle-snakes for the catching and retaining their food; secondly, the poisonotis fangs which kill their prey: and, as they neither chew nor bruise their food, but swallow it whole, they have no occasion for grinders. Of the first sort of teeth there are in the lower jaw two rows on each side, and five in a row, the inward lesser than the outward, and in all twenty: in the upper jaw are only sixteen, five on each side placed backwards; and six before; and none of those are poisonotis. The fatal fangs are placed without the upper jaw, towards the fore part of the mouth, not fastened to the jaw-bones, as the other teeth, but to muscles or tendons, except the two outermost and largest, which are fixed to a bone that may be taken for the ear-bone. These fangs are not to be perceived on first opening the mouth, for they lie flat under a strong membrane or sheath*, but are to be erected upon occasion. They are hooked, and in all of them, especially the larger, there is a hole towards the root, and towards the point a very plain slit, from whence to the root they are perfectly hollow, as the doctor discovered by gently pressing the side of the gum with his finger; for then the poison rose through the hollow of the teeth, and issued out at the slit. This poisonous liquor is of a water-colour, slightly tinged with yellow.

* Mr. Ranby, who dissected the poisonotis apparatus of a rattle-snake, thinks the use of this membrane is to prevent the involuntary discharge of the poison out of the fangs. This gentleman in some particulars differs from Dr. Tyson, but in general his observations agree very well with that ingenious anatomist.

Thus much may suffice for the description and anatomy of the rattle-snake. But it seems proper to add here a few miscellaneous observations of Mr. Dudley's, who says there are three sorts of this snake, distinguished by their colour, viz. a yellowish green, a deep ash-colour, and a glossy black. Both men and beasts, he assures us, are more afraid of a rattle-snake than of any other serpent, and the eye of this reptile has something in it very singular and terrible. Whereas a common snake avoids a man, the rattle-snake never turns out of the way; but as he creeps with his head close to the ground, and moves very slowly, a person may easily get out of his reach. His leaping and jumping to do mischief is no more than extending or uncoiling himself; for in leaping they do not remove their whole body, as other animals do; so that a man is in no danger of them, if his distance be more than their length: nor can they do any harm when they are in their ordinary motion, till they first coil and then extend themselves, which are both done in a moment's time. They are always coiled when they rest or sleep, and they are observed to be exceeding sleepy.

The same author informs us, that these snakes make the greatest rattling in fair weather, and when it is rainy they make none at all; so that the Indians do not care to travel in the woods in time of rain, for fear of getting amongst them before they are aware. Another circumstance of their rattling has been observed, viz, that if a single snake be surprised and rattles, and there be others near him, they all take the alarm, and rattle in like manner.

Their common food consists of toads, frogs, ground-mice, crickets, grasshoppers, and other in-

sects ; and the rattle-snakes themselves serve for food to bears ; and even hogs will eat them without harm. They are viviparous *, and usually bring forth about twelve :—They cast their skins every year, and generally den among the rocks in great numbers together. They retire on the approach of winter, and come abroad at the beginning of summer ; when the hunters watch them, and, as they come out to bask in the sun, kill them by hundreds.

The rattle-snake's poison is unquestionably one of the most subtle and dangerous in the whole animal kingdom. Of this we have some extraordinary instances given us by captain Hall, who, being in South Carolina, procured a fine healthful rattle-snake, about four feet long, and with one Mr. Kidwell, a surgeon, and three or four other gentlemen, made several experiments to try the effects of its poison. They got three cur-dogs, the largest not bigger than a common harrier ; and the snake being tied and pinned down to a grass-plat, they took the largest of the dogs, and having tied a cord round his neck so as not to strangle him, the captain held one end, and another person the other. Immediately on bringing the dog over the snake, he raised himself near two feet, and bit the dog as he was jumping. The dog yelped, by which the captain perceived he was bitten, and, pulling the dog to him as fast as he could, he found his eyes fixed, his tongue between his teeth, which

* This is a confirmation of the rattle-snake's being of the viper kind, for it is observed, that vipers bring forth their young alive, whereas common snakes lay their eggs in dung-hills, or other places proper to hatch them by their warmth, and therefore are reckoned amongst the oviparous animals.

were close ; his lips drawn up so as to leave his teeth and gums bare ; and, in short, he expired in a quarter of a minute. They could not see where the bite was, nor observe any blood ; upon which ordering some hot water to scald the hair off, they discovered only one puncture, with a bluish-green colour appearing a little round it. This was just between his fore legs and his breast, where the hair was thinner than in some other places.

Half an hour after this they took a second dog, which was somewhat smaller, and brought him in like manner over the snake, which bit his ear, so that all the company saw it. The dog yelped loudly, showed signs of being very sick, reeled and staggered about for some time, then fell down, and struggled as if convulsed, and for two or three times got up, each time wagging his tail, though slowly, and endeavouring to follow a negro-boy, who used to make much of him. They put him into a closet, and ordered the boy to look after him, who brought word in two hours that the dog was dead.

About an hour after the second dog was bitten, they took the third in like manner, which the snake bit on the right side of the belly, so that he drew blood. The dog for about a minute did not seem to be hurt, so they let him go, and saw no more of him ; but the next day a woman, who owned him, came to the captain, complaining of his cruelty in killing her dog.

Four days afterwards they got two dogs, as large as common bull-dogs ; and the first, which the snake bit on the inside of his left thigh, died exactly in half a minute, according to the watches of two gentlemen present. There were two very

small punctures in his thigh, which looked livid, though no blood was drawn.—The second dog was bit about an hour after the first, on the outside of his thigh, where they perceived blood at two places; he soon sickened, and died in four minutes.—As they thought the snake's poison was not spent, they got a cat, which he bit an hour after. She was very sick, and they put her in a closet; but by some means or other she got out, and the next morning was found dead in a garden.

A month after these experiments were made, the captain procured a common black snake, not of the viper kind, about two feet and a half long, and just taken; and, putting this and the rattle-snake together, he irritated them so that they bit each other. He perceived that the black-snake had drawn blood of the rattle-snake before he took them asunder; the black snake died in less than eight minutes, but the rattle-snake did not seem sick, or at all the worse for his wound.

The last experiment the captain made with this snake was to try whether his poison would not prove mortal to himself. In order to this he hanged him in such a manner that he was not above half his length on the ground, and then so irritated him by pricking and scratching him with two needles fastened to the end of a stick, that he soon bit himself, after having several times attempted to bite the stick. He then let him down, and he expired in eight or ten minutes. The snake was then cut into five pieces, and given to a hog, the head part first, in the sight of several people. The hog ate up all the snake, and ten or twelve days afterwards the captain saw the hog alive and healthful; which confirms the account of Mr. Dudley above-mentioned.

With respect to the cure of the bite of the rattle-snake, it is natural to think, that, if death follows it in so short a time, no remedy can reasonably be expected : but why might not olive-oil, if immediately applied to the wound, be as certain a cure in this case, as it has been found to be for the bite of a viper *, especially as the rattle-snake is of that kind; and probably their poison is much of the same nature? However, it is wisely ordered by Providence, that the countries infested by these noxious animals produce effectual antidotes against their poisons ; and the Americans are not without a specific even against the most sudden efforts of this dangerous poison, viz. the serpentaria, or snake-root, of which there are various kinds, as that of Virginia, that of Brasil, that of Canada, &c. Those who travel or hunt in the woods carry this root constantly about them, to chew and swallow as soon as they are bit by a rattle-snake, the stagnation of the blood being prevented by its peculiar activity. Nay, we are told, this root not only cures the bite of the rattle-snake, but that the animal flies from the smell of it ; for which reason travellers carry it with them on the end of a staff, to present towards the snake if he happen to come in their way.

The account we have of the discovery of the virtue of this root in curing the bite of the rattle-snake is this : A nation of the northern Indians, called Senekkas, observing that the root and flowers resembled the rattle of the snake, concluded that Providence had impressed that characteristic to point out it's use. These Indians, returning from a war with a southern nation, called Cata-

* See remarkable instances of this kind in vol. vii. p. 192.

Whales, in the year 1712, communicated the efficacy of this root to a planter on the frontiers of Virginia, who imparted it to his neighbours, and so it was soon known through those parts of America. And hence a particular species is named Senekka rattle-snake root, to distinguish it from other species which are much inferior in virtue.

After all, so speedy are the terrible effects of this snake's poison in many instances *, that it is the opinion of Capt. Hall, a judicious and observant person who lived several years in Virginia, that the safest and surest way of cure is to cut out immediately the part where the wound is made; for he has seen several, who, following that method upon being bit, have carried hollow scars about them, as marks of the narrow escapes they had had, but they never felt any inconvenience afterwards.

But, though we have said so much of the rattle-snake, we must not yet dismiss the subject; for besides the surprising effects of its poison, there are others attributed to its eyes almost equally astonishing, which ought not to be passed over in silence. The effects that we mean are said to be

* To the instances already given of the strength and virulence of this poison on animals, we may add another of the same on a vegetable body, which is mentioned by Col. Beverly, who says he was informed by Col. Taylor, that, being in company with others in the woods, they found a rattle-snake, and cut off his head. Then with a green stick which he had in his hand, about eighteen inches long, the bark of which was newly peeled off, he urged and provoked the head, till it bit the stick with fury several times; whereupon the colonel observing small green streaks rise up along the stick towards his hand, he threw it on the ground, and in a quarter of an hour it split into several pieces, and fell asunder from end to end.

produced by a certain fascinating power in the eyes of the rattle-snake, which, by keeping them fixed on any small animal, as a squirrel, a bird, or the like, though sitting on the branch of a tree, at a considerable height, can draw such animal down into its mouth. This perhaps may seem utterly incredible to people who have never heard or considered any accounts of this nature; but it is commonly asserted that all sorts of snakes have some degree of this faculty of charming or fascinating other animals by looking stedfastly upon them.

Col. Beverly tells us, that, as he was hunting in the woods, and had strayed from his companions, he was entertained at his return with an account of a pleasant encounter between a dog and a rattle-snake about a squirrel. The snake had got the head and shoulders of the squirrel into his mouth, which being something too large for his throat, it took him up some time to moisten the fur of the squirrel with his spawl, to make it slip down. The dog took this advantage, seized the hinder parts of the squirrel, and tugged with all his might. The snake on the other side would not let go his hold for a long time, but at last gave up his prey, and the dog ate the squirrel without any injury.

The same gentleman assures us, that several persons have seen squirrels run down a tree directly into a snake's mouth; and have also seen birds fluttering up and down, and chattering at these snakes, till at last they dropped down before them. But, besides the relations of others, he gives a very remarkable instance of this fascination, whereof he himself was an eye-witness, with two other persons in company. Having stopped at an orchard

by the side of the road, they were entertained with the whole process of a charm between a rattle-snake and a hare, the hare being better than half-grown. It happened thus : One of the company, searching for cherries, spied the hare sitting, and though he went close by her she did not move, till he, (not suspecting the occasion of her tameness) gave her a lash with his whip ; upon which she ran three or four yards, and there sat down again. The gentleman, not finding the fruit ripe, immediately returned the same way ; and near the place where he struck the hare he spied a rattle-snake. Still not suspecting the charm, he went back about twenty yards to a hedge, to get a stick to kill the snake ; and at his return he found the snake removed and coiled in the same place from whence he had moved the hare. This induced him to look for the hare again, and he soon spied her about ten feet distant from the snake, in the place to which she had started when he whipped her. She was now lying down, but sometimes raised herself on her fore feet, struggling as it were for life, to get away, but could not raise her hinder parts from the ground ; and sometimes she fell flat on her side, panting vehemently. The hare and snake were in this condition when our author was called, who says, that, though all three went within five yards of the snake to have a full view of the whole, the snake did not take the least notice of them, nor so much as give a glance towards them. There they stood at least half an hour, the snake not altering one jot ; but the hare often struggled to get up and fell on its side again, till at last she lay still for some time as dead. Then the snake moved out of his coil, and slid gently and smoothly towards the hare, his colours

at that instant being much more brilliant than at other times. As the snake moved along, the hare happened to make another struggle, upon which the snake made a stop, lying at his length till the hare was quiet, and then he advanced till he came up to the hare's hinder parts, which in all this process had been towards him. There he surveyed the hare all over, raising part of his body above it ; then he turned off and went to the nose, and after that to the ears, which he took into his mouth one after the other, working them as a man does a wafer to moisten it. He then returned to the nose, and took the face into his mouth, straining and gathering his lips, sometimes on one side, and sometimes on the other. At the shoulders he was a long time puzzled, often pulling and stretching the hare out at length, till at last he got the whole body into his throat. The spectators then advanced, and our author, taking the twist-band off his hat, made a noose, and put it about the neck of the snake. This made him very furious ; but having secured him they put him into one end of a wallet, and carried him on horseback five miles to the house where they lodged that night : and next morning they killed him, and took the hare out of his belly. The head of the hare began to be digested, and the hair to fall off, having lain in the snake's belly about eighteen hours.

Here seems to be a plain instance of the fascinating power in the rattle-snake; but Sir Hans Sloane thinks the whole mystery of the affair is chiefly this, that, when such animals as are the proper prey of these snakes, as small quadrupeds, birds, &c. are surprised by them, they give them a bite, and the poison allows them time to run a

small way, or perhaps a bird to fly up into the next tree, where the snakes watch them with great earnestness till they fall down, or are perfectly dead, when, having licked them over with their spawl or spittle, they swallow them down.

Now we grant that Sir Hans's conjecture, is very natural, and perhaps the hare above mentioned might have been surprised and bit by the rattle-snake, before it was affected in such a manner; but still there are many instances of what we call fascination, not only in the rattle-snake but in other animals, where no previous bite or other injury has been received by the animal. Dr. Sprengell's account seems to be such an instance, who tells us, that at Milan he met with a viper-catcher who generally kept a considerable number of these animals alive in a back room open at top: and having one day got a female viper big with young, a mouse was thrown amongst them; but of the whole number of vipers, which were upwards of sixty, not one concerned himself in the least about the mouse, till the pregnant female viper and the mouse interchanged eyes, as the doctor expresses it. Upon this the mouse startled; but the viper raised her head, and turned her neck into a perfect bow, her mouth being open, her tongue playing, her eyes all on fire, and her tail erect. The mouse seemed soon recovered of its fright, and would take a turn or two, sometimes more, pretty briskly round the viper, giving now and then a squeak, till at last it ran swiftly into the mouth of the viper, and gradually sunk down the gullet. All this while (adds our author) the viper never stirred out of her place.

Something of this kind almost every one may have observed in the setting dog, the effects of

whose eye on the partridge are very remarkable: The poor bird, when once its eyes meet those of the dog, stands as if confounded, regardless of itself, and easily lets the net be drawn over it. And we have read of squirrels so stupid and overcome by a dog's staring hard at them, that they have dropped from the tree almost into his mouth.

Amongst the curious animals of North America we may reckon the little insect which affords that valuable drug called cochineal, of great use in dying crimsons and scarlets, and esteemed in medicine as a cardiac and alexipharmic. Naturalists have been strangely divided with respect to the origin of cochineal, some referring it to the vegetable, and others to the animal kingdom; to which last it is now proved to belong by incontrovertible evidence.

These insects, so highly valued in every part of the world for the incomparable beauty of their colour, are of two sexes, but exceedingly dissimilar in their appearance. The female is ill shaped, tardy, and stupid; its eyes, mouth, and antennæ, are fixed so deep, and are so concealed in the folds of the skin, that it is impossible to distinguish them without a microscope. The male is very scarce, and is sufficient for upwards of three hundred females: it is active, small, and slender in comparison with the female, and its neck is much narrower than the rest of its body. Its throat is of an elliptic form, a little longer than the head and neck put together, and flattened below; its antennæ are jointed, and from each joint issue long slender hairs, that are disposed in pairs on each side. It has six feet, each formed of distinct parts. From the posterior extremity of its body two large hairs

or bristles are extended, which are about four or five times the length of the insect.

To the upper part of the thorax are affixed two wings of an oblong form, which fall, like the wings of common flies, when the insect walks or rests: they are strengthened by two oblong muscles, one of which extends itself on the outside all round the wing; and the other, which is internal and parallel to the former, seems interrupted toward the summit of the wings.

When these little animals can bear the open air, which is early in the spring, they soon grow large enough to produce young ones; at which time they put twelve or fourteen together into a little nest, made of fine soft hay, straw, moss of trees, or the down that immediately encompasses the cocoa-nut. These nests are placed upon the nopal, or prickly Indian fig-tree, which is carefully cultivated for this purpose; and in three or four days a great many young ones are produced, after which the old ones die. The young ones, coming out of their nests, climb up the nopal, fix themselves to it, and suck its juice, which is their only nourishment, for they do not eat the plant; and therefore they seek out those parts of it that are greenest and fullest of juice, taking care to place themselves so as to be screened from the wind and weather. During this time, whilst they are growing up and become pregnant, great care is taken that no vermin incommodè them, and also to keep them clean, and disengage them from certain threads like cobwebs, that grow upon the nopal. They are likewise to be sheltered from too much heat or cold, and from the rain and wind, for the finest of these insects are very tender. The wild sort indeed bear all

these inconveniences; but then they are gritty, of an ill smell, and of little value.

With respect to the gathering of cochineal, they first take the females, which die in the nests, after having brought forth their young; and three or four months after this, as the season permits, when the first young ones are become large enough to bring forth, and have produced some few, the Indian carefully gather them off the nopal with a small brush like a pencil. Being thus collected, the little creatures are killed by hot water or fire, and are called the second gathering, or rather the first of the young ones that have been nourished and raised in the open air. In three or four months more they gather the second brood of those that have been brought forth upon the nopal, and have likewise produced some young ones; which is done much in the same manner as before, only now they take from the plant a great many young ones with their parent insects; and, from the number of small ones found amongst this gathering of cochineal, it is called granilla. In the mean time they keep a number of these young ones alive upon the nopals, which they pluck up or cut down, and take them into their houses, in order to nourish the insects during the rainy season. Lastly, when these are grown large, they put them into the nest, and proceed in the manner above related; so that they usually make three gatherings in a year.

The manner of planting the nopal is, by making rows of holes about half a yard deep, and two yards distant from each other. In each of these holes are placed one or two leaves of the Indian fig-tree, in a flat position, and then they are covered with earth. This leaf soon shoots up

into a single stem, which during its growth, divides into several branches, which successively produce fresh leaves, the largest being nearest the stem, and full of knots, as are also the branches, and from these the leaves have their origin. The plant seldom exceeds three yards in height; its blossom is small, of a bright red, and in the shape of a bud, from the centre of which proceeds the fruit. When the fig is ripe, the outward skin becomes white, and yet the pulp is fully impregnated with a deep red, yet few fruits are more pleasant and wholesome. It is remarkable that this insect does not, in any visible manner, injure the plant, but extracts its nourishment from the most succulent juice, which it sucks by means of its proboscis, through the fine teguments of the leaves.

There are three ways of killing these insects, viz. by hot water, by little ovens made for that purpose, or by roasting them upon flat stoves with fire under them, such as the Indian women used to bake their bread. These three different methods give the cochineal three different colours. The first makes it of a brown red, the hot water taking off the whiteness that covers the insect when alive. The second makes them of an ash-colour, and marbled; and the third makes them black as if they had been burnt.—Of the old ones that die after bringing forth their young, four pounds, when dried, produce but one, or rather one pound is reduced to four ounces; but three pounds only of the living ones, that have been carefully taken off the nopal, being killed and dried, produce the same quantity.

However, it seems proper to observe, that, though cochineal is now known to be produced

by an animal, there is a berry growing in America which yields a dye almost as beautiful as that of the insect. The first shoots of the tree produce a yellow flower, then comes the fruit which is long, and opens when ripe with a cleft of three or four inches. This fruit is full of kernels or grains, which fall on the least agitation, and are carefully gathered up by the Indians. Eight or ten of these fruits will yield about an ounce of grain ; and a person may easily take it for the animal cochineal, but this last is much the most esteemed.

As we are now speaking of insects, it may not be amiss to introduce here an account of a method in New England of discovering the hives or nests of bees in the woods, in order to get their honey. For this end the hunter (as he is called) in a clear sun-shiny day takes a plate or treneher with a little sugar, honey, or molasses, and, when arrived in the woods, he sets it down on a rock or stump of a tree. This is soon found out by the bees, which are generally supposed to smell honey or wax at above a mile's distance. When they are gathered about the plate, and have fed a little while, the hunter secures a few of them in a box ; and after a short time he lets one of them go, observing very carefully the course he steers ; for, after he rises in the air, he flies directly on upon a strait course to the tree which contains the hive or nest. Now, the hunter being provided with a pocket-compass, a rule, and other implements, with a sheet of paper, he sets down the course of the bee, supposing it west, or any other point ; and by this he is sure the tree must be somewhere in the west line from his station : but, to know the exact distance he removes from thence either north or south, suppose a hundred perches, or if it be more it will be the

more exact, because the angle will not be so acute. He then lets go another bee, observing the course carefully ; for this, like the first, after mounting to a convenient height, flies directly to the hive ; so that the hunter has nothing to do but to find where the courses of the first and second bee intersect each other, and there is the tree where the honey is lodged.

All this is founded on the straight or direct motion of bees when bound home with their honey, which is found to be certain by the constant observation and experience of the hunters, who of late, have used this mathematical way of finding honey in the woods with great success. But it is worth observing, that all the bees they have either in their gardens or woods, which are now in great numbers, are the produce of such as were carried from England about a hundred years ago ; for the first planters in New England, as Mr. Dudley informs us, never observed a bee in the woods till many years after the country was settled : And what proves this beyond dispute is, that the Indians have no word in their language for a bee, as they have for all animals that are natives of the country, and therefore used to call a bee by the name of the Englishman's fly.

We have already described the whales that are found in the seas of Greenland, and the method of taking them * ; but there are several curious particulars relating to those found on the coast of New England, which ought by no means to be omitted. There are several sorts of whales on this coast, of which the most remarkable are the true whale, or that which yields the whalebone, and another

* See vol. iii. page 6.

which furnishes us with spermaceti. The whalebone whale is sixty or seventy feet long, (for these are not so large as those of Greenland) and very bulky, having no scales, but a soft smooth skin, and no fins, except one on each side, from six to eight feet in length, which they are not observed to use, unless in turning themselves, and while they are young, and are carried by their dam on the flukes of their tails ; for then with those fins they clasp themselves round about her, otherwise they would be in danger of falling off. This fish when first brought forth, is about twenty feet long, and of little value, but then the dam is exceeding fat. At a year old, when they are called *short-heads*, they are very fat, so as to yield about fifty barrels of oil ; but by that time the dam is very poor, and will not yield above thirty barrels, though of a large size. When two years old they are called *stunts*, being stunted after weaning, and then generally yield from twenty-four to twenty-eight barrels. After this they are called *scull-fish*, their age not being known, but only guessed at by the length of the bone in their mouths. This grows on each side of the upper-jaw, and is sometimes six or seven feet in length. A large whale has yielded a thousand weight of bone, a hundred and thirty barrels of oil, and near twenty out of the tongue alone.

The whale producing sperma-ceti is much of the same dimensions with the former, but is of a greyish colour, whereas the others are black. He has a bunch on his back as big as a man's head, and is distinguished from the former species by having no whalebone in his mouth, instead of which there are rows of fine white teeth in each jaw, five or six inches long. Our author sent the Royal Society

one of these teeth, taken from a whale forty-nine feet long, and whose head yielded twelve barrels of spermaceti oil. These are more gentle than the other species of whales, and seldom fight with their tails, but, when struck, usually turn upon their backs and fight with their mouths. The oil made of the body of this fish is much clearer and sweeter than that of other whales.

The spermaceti, as our author calls it, which makes this fish so valuable, lies in a large trunk four or five feet deep, and ten or twelve feet long, near the whole depth, breadth, and length of the head, in the place of the brains, and seems to be of the same consistence, being disposed in several membranous cells, and covered with a thick gristly substance below the skin, through which they dig a hole, and take out the clear oil. It is found indeed in other parts of the fish, but not in so large quantities nor so good as in the head, where it is thoroughly prepared by nature; and it is affirmed that this trunk or cavity will yield from ten to twenty barrels, and the whole fish from twenty to fifty barrels of the common oil.

The ancients were great strangers to the origin of the spermaceti, insomuch that Schroder seems to doubt whether to reckon it an animal or mineral substance. And indeed the method of preparing it at present, is a secret in the hands of a few persons, according to Pomet, who describes the process as follows. The oil or brain, being taken out of the animal, is melted over a gentle fire, and put into moulds like those wherein sugar-loaves are formed. When cold and drained it is melted over again; and in this manner they proceed till it be well purified, and become very white. Then with a knife, made for that purpose, it is cut into

scales or flakes, such as we have it from the druggist. Now Pomet may possibly be right as to the process generally used, but Dr. James says he has seen spermaceti which has undergone no treatment at all, except being put into paper-bags, so that the oil that adheres to it might be absorbed.

The true spermaceti is very white, and in very small flakes, which by rubbing upon the hand dissolve into a sort of oil, and do not adhere to the palate when chewed, as the common sort will, which is probably adulterated with wax or some other substance. In many cases it is a noble medicine, but is principally used in bruises, inward hurts, &c. It is an excellent balsamic in disorders of the breast; and in coughs, sharp rheums, &c. it is very safe, pleasant, and effectual; as also in pleurisies and inward imposthumations. Outwardly used, it is emollient and healing; but its greatest use this way is in the small-pox, melted with the oil of almonds. With this the pustules are just moistened when they begin to harden; and it wonderfully prevents those scars they are apt to leave behind them. It is sometimes also used as a cosmetic by the ladies, both in paints and washes; and candles are likewise made of it, which are superior to the finest wax candles in colour and lustre.

The people of New England, says Mr. Dudley, used formerly to kill the whales near the shore; but now they go off to sea in sloops and whale-boats, in May, June, and July, between Cape Cod and Bermudas, where they lie by in the night, and sail to and fro in the day-time, and seldom miss of them. The best season for taking the whalebone kind is from the beginning of February to the end of May, and for the spermaceti whale from the be-

ginning of June to the end of August.—The boats, they use in pursuing the whale are made of cedar clap-boards, and are so very light that two men can easily carry them, though they are twenty feet long, and contain six men, viz. the harpooneer, four rowers, and the steersman. These boats run very swiftly, and by reason of their lightness can be readily brought on and off, and so kept out of danger. Sometimes the whales are killed with a single stroke, and sometimes will hold the whalemen in play for half a day together, and even make their escape after they have been lanced and have spouted blood, which is a sign they have received their mortal wound. The bone-whales have two spout-holes, but the spermaceti whales have only one.

The prodigious strength of the whale lies chiefly in his tail, of which Mr. Dudley and other authors have given us variety of instances. A boat has been cut down from top to bottom with the tail of a whale, as it cut with a saw, the boards being scarcely splintered. An oar has been cut off while a man had it in his hand, without feeling the least jarring. But one instance of the strength of this animal, as related by Mr. Dudley, will be sufficient, instead of many that might be added. Some years ago one of the fin-back whales, a species found on the coast of New England, came into a harbour near Cape Cod, and towed away a sloop of about forty tons out of the harbour into the sea. It is supposed the whale was rubbing herself against the fluke of the anchor, or accidentally got the fluke of the anchor into the orifice of the uterus, and, finding herself caught, tore away with such violence, that she towed the ship out of the harbour as fast as if it had been under sail with a good

gale of wind, to the astonishment of the people on shore, for there was nobody on board the vessel. When the whale came into deep water, she plunged downwards, and had like to have carried the sloop along with her; but the cable gave way, and so the sloop was recovered and brought back into the harbour. This whale was found dead some days after upon the shore, with the anchor sticking in her belly.

The whalebone whales are generally supposed to live upon some oozy matter they suck up from the bottom of the sea; but an experienced fisherman told Mr. Dudley, that he had observed this whale, in still weather, skimming on the surface of the water, to take in a sort of reddish spawn that sometimes lies on the sea for a mile together. The spermaceti whale, besides other food, feeds much upon a small-fish, which has a kind of bill, and is called by the fishermen a squid fish. The fin-back whale, which has a larger swallow than the other species, lives on mackarel, herrings, and such sort of fish, great shoals of which he will run through, and with a short turn cause an eddy or whirlpool, whereby the fish are brought into a cluster, and the whale will take in some hundreds of them at a time.—It is to be noted, that, though whales are gregarious, and are sometimes seen a hundred in a company, the several kinds do not mix with one another, but keep by themselves.

In speaking of the whales of Greenland we observed, that these animals bring forth their young alive, and suckle them with their milk; and this is confirmed by Mr. Dudley's account of the New-England whales, which are therefore termed bull, cow, and calf. They bring forth but one at a time, and only every other year, and are supposed to go with young about nine or ten months. The

calf or young whale has been found perfectly formed in the dam when not above seventeen inches long, and white ; but, when brought forth, it is usually twenty feet long as already mentioned, and of a black colour. The female has two teats, six or eight inches long ; and, when she suckles her young, she turns herself almost upon her back, upon the surface of the water. Her milk is white, and, upon opening a young sucking whale, it has been found curdled in his bag, just like that of a calf. For the first year they all suck the dam, but live, after they are weaned, in the manner above related.

The care the females take of their young is very remarkable. They not only carry them on their tails, and suckle them, but often rise with them to the top of the water for the benefit of the air, and when they are chased they will not strike with their tail ; but, if the young one happens to drop off, the dam turns about, and passing underneath takes it on again. If their young be ever so much wounded, as long as they perceive any life in them, they never forsake them ; and therefore care is taken, by those who kill these fish, only to fasten the young one, and not to kill it, till they have first secured the dam ; for if the young whale be killed first, the dam grows so outrageous that it is almost impossible to manage her. When pursued they will keep under water for half an hour or more ; but if a female have a young one on her tail, she rises oftener, that it may take breath ; otherwise, when not disturbed, they usually rise and blow about once in a quarter of an hour, spouting out water, and drawing in fresh air.

Mr. Dudley informs us of a sort of fish that prey upon whales, often killing the young ones, though

they seldom venture upon the old ones, unless they are much wounded. The whale-men of New England call these fish whale-killers, for they go in company by dozens, and will set upon a young whale, and bait him like so many bull-dogs, some laying hold of his tail, others of his head, and so bite and worry him, till being heated he lolls out his tongue, which some of them are sure to catch at ; but if they miss their aim, they fasten on his lips, and thus torture him till they have killed him. When they have done this, they feed chiefly on his tongue and head, but leave him when he begins to putrify. These killers are from twenty to thirty feet long, and have teeth in both jaws that lock within each other. They are of such vast strength, that when several boats together have been towing a dead whale to the shore, one of them has fastened his teeth in it, and dived with it in an instant to the bottom.

Before we dismiss this subject, it seems proper to add an account of the sword-fish and thrasher, two allied enemies of the grampus, a species of whale frequenting the seas of North America. Mr. Smith, author of the history of Nevis, says, he has often been an eye-witness of the battles between these allies and their common enemy the grampus, who as naturally encounter each other when they meet at sea, as the elephant and rhinoceros do at land. The sword-fish gets underneath the grampus, and pricks him in the belly, till he rises to the surface of the water ; and then the thrasher mounts his back, and beats him sharply with his tail. Our author was once within less than a hundred yards of a fight between these creatures, and assures us they caused the spray of the sea to fly up very violently all round them ; but,

to the best of his discernment, the thrasher seemed to fight with a weapon about three yards long, like a monstrous broad-sword, issuing from his nose, and not with his tail, as is commonly reported.

CAVES, SPRINGS, LAKES, CATARACTS, &c.

AN account has been given in the Philosophical Transactions of a remarkable cave some leagues to the north-west of Mexico, gilded all over with a sort of leaf-gold, which had deluded many Spaniards by its promising colour, for they could never reduce it into a body, either by quicksilver or fusion. Our author went thither one morning with an Indian for his guide, and found its situation was pretty high, and in a place very proper for the generation of metals. As he entered into it, the light of the candle soon discovered on all sides, but especially over his head, a glittering canopy of mineral leaves ; but on his snatching at them, there fell down a great lump of sand, that not only put out his candle, but almost blinded him : and, on his calling aloud to his Indian, who stood at the entrance of the cave, it occasioned such thundering and redoubled echoes, that the poor fellow imagining he had been wrestling with some fearful spirit, soon quitted his station, and thereby left a free passage for some rays of light to enter, and serve him for a better guide. Our author's sight was somewhat affected by the corrosive acrimony of the mineral dust ; but, having relighted his candle, he proceeded in the cave, heaped together a quantity of the mi-

neral mixed with sand, and scraped off from the surface of the earth some of the glittering leaves, none of which exceeded the breadth of a man's nail, but with the least touch were divided into many lesser spangles, and with a little rubbing they left his hand gilded all over.

On the western coast of Mexico there is a vast bollow rock, which, having a large aperture at the top, makes a frightful noise at every surge of the sea, and sometimes spouts up water like a whale, to a prodigious height.

In the town of Pomfret, in Connecticut, is a cave rendered remarkable by a singular adventure of General Putnam. This cave has been described and the story elegantly told by Colonel Humphreys, to whom we are indebted for the following particulars.

Some time after Mr. Putnam had removed to Connecticut, the wolves, which were then very numerous, broke into his sheep-fold, and killed seventy fine sheep and goats, besides worrying several lambs and kids. This dreadful havoc was committed by a she-wolf, which, with her annual whelps, had for several years infested the neighbourhood. The whelps were commonly destroyed by the vigilance of the hunters, but the old one was too sagacious to come within reach of gun-shot; and upon being closely pursued, she would generally fly to the western woods, and return the next winter with another litter of whelps.

This animal, at length, became such an intolerable nuisance, that Mr. Putnam and five of his neighbours agreed to hunt alternately, until they could destroy her; and two of them, in rotation, were to be constantly in pursuit. It was known, that, having lost the toes from one foot, by a steel

trap, she made one track shorter than the other. By this vestige, the pursuers recognized, in a light snow, the route of the wolf. Having followed her to Connecticut river, and found she had turned back toward Pomfret, they immediately returned, and by ten o'clock next morning, the blood-hounds had driven her into a cave about three miles distant from Mr. Putnam's house. The people soon assembled with dogs, guns, straw, fire, and sulphur, to attack their common enemy; and several attempts were made to dislodge her from the den, but the hounds came back wounded and intimidated; and neither the smoke of blazing straw, nor the fumes of burnt brimstone could compel her to quit her retirement.

Wearyed with these fruitless attempts, which had continued nearly twelve hours, Mr. Putnam proposed to his negro servant to go down into the cavern and shoot the wolf; and on his declining the hazardous service, the General resolved himself to destroy the ferocious animal, lest she should escape through some unknown fissure of the rock. Accordingly, having provided himself with several strips of birch bark, to light him in this darksome cave, he pulled off his coat and waistcoat, and having a long rope fastened round his legs, by which he might be drawn back at a concerted signal, he entered head foremost, with the blazing torch in his hand.

The aperture of the cave, on the east side of a high ledge of rocks, is about two feet square: from thence it descends obliquely fifteen feet; and then running horizontally about ten more, it ascends gradually sixteen feet towards its termination. The sides of this cavity consist of smooth solid rocks, which seem to have been divided

from each other by an earthquake. The top and bottom are also composed of stone, and the entrance, in winter, being cover'd with ice, is extremely slippery. It is in no place high enough for a man to raise himself upright, nor in any part more than three feet broad..

Mr. Putnam having groped his passage to the horizontal part of the cavern, the most terrifying darkness appeared in front of the dim circle of light afforded by his torch ; and all was silent as the house of death. Cautiously proceeding onward, Mr. Putnam came to the ascent, which he slowly mounted on his hands and knees, till he discovered the glaring eye-balls of the wolf, who was sitting at the extremity of the den. Startled at the sight of fire, she gnashed her teeth and gave a sullen growl ; upon which the General kicked the rope, as a signal for pulling him out. The people at the mouth of the cave hearing the growling of the wolf, and imagining their friend to be in the most imminent danger, drew him out with such celerity, that his shirt was stripped over his head, and his skin severely lacerated. However he boldly persisted in his resolution, and, having adjusted his clothes, and loaded his gun with buck-shot, he descended a second time. On his second approach, the wolf assumed a very fierce and terrible countenance, howling, rolling her eyes, snapping her teeth, and dropping her head between her legs ; but when she was on the very point of springing on him, Mr. Putnam fired at her head, and was immediately drawn out of the cave. After refreshing himself, and permitting the smoke to dissipate, he went down again, and on applying his torch to the animal's nose, found her dead ; then taking hold of her ears,

and kicking the rope, he drew her forth, to the astonishment of all the admiring spectators.

In the township of Shrewsbury, in New Jersey, is a remarkable cave, in which there are three rooms. The cave is about thirty feet long; and fifteen broad; and each of the rooms is arched. The centre of the arch is about five feet from the bottom of the cave; the sides not more than two and a half. The mouth of the cavern is small; the bottom consists of a loose sand; and the arch is formed in a soft rock, through the pores of which, the moisture is slowly exudated; and falls in drops on the sand below.

At Swetara, in Pennsylvania, is a remarkable cave, on the east bank of Swetara river, about two miles above its confluence with the Susquehanna. Its entrance is very spacious, and descends so much, that the surface of the river is rather higher than the bottom of the cavern. The vault of this cave is of solid lime-stone rock, about twenty feet thick. It contains several apartments, some of which are very spacious and lofty. Water is incessantly distilling through the roof, and falls in drops to the bottom of the cave: these drops petrify as they fall, and have gradually formed solid pillars, which seem to support the roof. Some years ago, there were ten such pillars, each six inches in diameter, and six feet high; all so ranged, that the place they enclosed resembled a sanctuary in a Romish church:—

“No royal throne,” says Dr. Morse, “ever exhibited more grandeur than this *lusus naturæ*. The resemblances of several monuments are found indented on the sides of the cave which appear like the tombs of departed heroes. Suspended from the roof is ‘the bell,’ which is nothing more than

a stone projected in an unusual form, so called from the sound it occasions when struck, which is similar to that of a bell."

Some of the stalactites are of a colour like sugar-candy, and others resemble loaf-sugar ; but their beauty has been much defaced by some of the neighbouring peasants. There are several holes in the bottom of the cave, descending perpendicularly into an abyss below, which render it extremely dangerous to walk without a light. At the end of the cave is a little brook, which, after a short course, loses itself among the rocks. Beyond this brook is an outlet by a very narrow aperture, through which the vapours continually pass outwards with a strong current, and resemble at night, the smoke of a furnace. Part of these vapours appear, on ascending, to be condensed at the head of this great alembic, and the more volatile parts to be carried off, through the afore-mentioned aperture.

In Virginia, there are many caverns of very considerable extent. The most noted is called Madison's cave, and is situated near the southern river of Shenandoah. It is in a hill of about two hundred feet high, the ascent of which, on one side, is so steep, that a biscuit may be pitched from its summit into the river which washes its base ; and the entrance is in this side, about two thirds of the way up. "It extends," says Mr. Jefferson, "about three hundred feet into the earth, branching into subordinate caverns, sometimes ascending a little, but more generally descending, and at length terminates, in two different places, at basons of water of unknown extent, and which I should judge to be nearly on a level with the water of the river : however, I do

not think they are formed by reflux water from that; because they are never turbid; because they do not rise and fall in correspondence with that in times of flood or of drought; and because the water is always cool. It is probably one of the numerous reservoirs with which the interior parts of the earth are supposed to abound, and which yield supplies to the fountains of waters, distinguished only by its being accessible.—The vault of this cave is of solid lime-stone, from twenty to fifty feet high, through which water is continually percolating. This, trickling down the sides of the cave, has incrusted them over in the form of elegant drapery; and dripping from the top of the vault, generates on that, and on the base below, stalactites of a conical form, some of which have united, and formed massive columns."

Another of these caverns is situated near the North Mountain, in the county of Frederick. From the entrance, which is on the top of an extensive ridge, you descend thirty or forty feet, as into a well; and from this, the cave extends, nearly horizontally, four hundred feet into the earth, preserving a breadth of from twenty to fifty feet, and a height of from five to twelve feet. Mr. Jefferson informs us, that after entering this cave a few feet, the mercury, which in the open air was at 50 degrees rose to 57 degrees of Fahrenheit's thermometer, and continued at that to the remotest parts of the cave.

At a place called the Panther-gap in Virginia, is what is called the *Blowing Cave*, which is of about a hundred feet diameter, and constantly emits a current of air, with such force as to keep the weeds prostrate to the distance of twenty

yards before it: this current is strongest in dry frosty weather, and in long spells of rain weakest. There is another blowing cave in the Cumberland mountain, but all that is known of this is, that it is inconstant, and that a fountain of water issues from it.

On the side of a small hill near Tinmouth, in Vermont is a very curious cave. From the entrance, which is only four feet in circumference, there is a descent of a hundred and four feet, and then opens a spacious room twenty feet in breadth, and a hundred in length. The roof is of solid rock, from which water is incessantly dripping, and the glittering stalactites which hang from it, are continually increasing in number and magnitude; and the bottom and sides are also daily incrusting with spar and other mineral substances. On the sides of this subterraneous hall, are tables, chairs, benches, &c. which seem to have been artificially carved; and in a word, the whole room, when illuminated by candles, has an enchanting effect upon the eyes of a spectator.—“If,” says Dr. Morse, “we might be indulged in assigning the general cause of these astonishing appearances, we should conclude, from the various circumstances accompanying them, that they arise from water filtrating slowly through the incumbent strata; and taking up in its passage a variety of mineral substances, and becoming thus saturated with metallic particles, gradually exuding on the surface of the caverns and fissures, in a quiescent state, the aqueous particles evaporate, and leave the mineral substances to unite according to their affinities.” At the end of this cave is a circular hole, about fifteen feet deep, apparently hewn out,

in a conical form, enlarging gradually as it descends, in the form of a sugar-loaf: and at the bottom is a spring of fresh water, which is in perpetual motion, like the boiling of a pot.

At Stafford, in Connecticut, is a medicinal spring, which is said to be a sovereign remedy for scorbutic and cutaneous disorders: and at Guildford, in the same state, there is another spring whose water is of so curious a nature, that upon being taken from the fountain, it will evaporate, even though put into a bottle and tightly corked.

The most noted springs in the country of New York are those of Saratoga. They are eight or nine in number, and situated in the margin of a marsh, about twelve miles from the confluence of Fish-Creek and Hudson's River. They are surrounded by rocks of a peculiar nature, formed by the petrifaction of the water. One of them, however, more particularly attracts the attention, as it rises above the surface of the earth five or six feet, in the form of a pyramid. The aperture in the top, which discovers the water, is perfectly cylindrical, and about nine inches in diameter. In this the water is about twelve inches below the top, except at the time of its annual discharge, which is commonly in the beginning of summer. At all times it appears to be in as great agitation as if boiling in a pot, although it is extremely cold. The same appearances are observable in the other springs, except that the surrounding rocks are of different figures, and the water flows regularly from them.

From repeated observations and experiments, the principal impregnation of these waters has been found to be a fossile acid, which is predomi-

nant in the taste. They are also strongly impregnated with a saline substance, which is very discernible in the taste and smell of the petrified matter about them.—From the corrosive and dissolving nature of the acid, the water acquires a chalybeate property, and receives into its composition a portion of calcareous earth, which, when separated, resembles an impure magnesia.—As the different springs have no essential variety in the nature of their waters, but the proportions of the chalybeate impregnation, it is highly probable that they originate in one common source, but flow in separate channels, where they have a connection with metallic bodies, in greater or less proportions.

The prodigious quantity of air contained in this water produces the fermentation and violent action already noticed ; for after standing a small time in an open vessel, the air escapes, becomes vapid, and loses all that life and pungency which distinguish it when first taken from the fountain.—The particles of dissolved earth are deposited as the water flows off, which, with the combination of the salts, and fixed air, concrete, and form the rocks about the springs.

The effects produced by this water upon the human body are various ; the natural operation of it, however, is cathartic, and in some instances an emetic. As it is drank, it produces a very agreeable sensation in the mouth, but it is no sooner swallowed than it is succeeded by an unpleasant taste, and some pungent eructations, similar to those produced by a draught of cider, in a state of fermentation.

Several curious experiments having been made on these waters, we shall take the liberty to

I present our readers with the following, extracted from Dr. Mitchell's Journal.—

"A young turkey held a few inches above the water in the crater of the lower spring, was thrown into convulsions in less than half a minute, and exhibited evident signs of approaching death; but on removal, and exposure to the fresh air, it revived and became lively. On immersion again for a minute in the gas, the bird was taken out languid and motionless.

A small dog put into the same cavity, and compelled to breathe the contained air, was, in less than a minute, thrown into convulsive motions, and soon after, lost the power to cry or move; but when taken out and exposed to the fresh air, he began to revive, and soon acquired strength enough to stagger from the place.

A trout recently caught, and briskly swimming in a pail of brook water, was carefully put into a vessel just filled from the spring: the fish was immediately agitated with strong convulsions, gradually lost the power to move or coise itself, and in a few minutes expired.

A candle repeatedly lighted and let down near the surface of the water was instantaneously extinguished, and not a vestige of fire remained about the wick.

In addition to these experiments it is said, that a bottle filled with the water, and shaken, emits a considerable quantity of aerial matter, that either forces out the cork, or bursts the vessel.—Wheaten flour, also, when moistened with this water and made into dough, will rise, with a proper application of heat, into light spongy bread, without the aid of yeast or leaven; from which circumstances it appears, that the air ex-

tricated from the water is precisely similar to that produced by ordinary fermentation.

We are likewise informed; that some lime-water, made of abalactiles brought from a subterranean cavé at Rhinebeck, became immediately turbid on mixture with the spring water; but when the water had been recently drawn, the precipitate was speedily re-dissolved:—Some of the rock surrounding the spring, on being thrown into a fire, calcined to quick-lime; and slacked very well; and it has been frequently observed, that on the evaporation of the aerial, the water has lost its transparency, and deposited a calcareous sediment: whence it appears that the gas is aerial acid, that the rock is lime-stone, and that by means of the former the water becomes capable of dissolving and conveying the latter.”

In the county of Morris, in New Jersey, is a cold mineral spring, much frequented by valitudinarians, and used with considerable success: and in the township of Hanover; in this county, on a ridge of hills, are a number of wells, which regularly ebb and flow about six feet, twice in every twenty-four hours. These wells are nearly forty miles from the sea, in a straight line.

In the county of Cape May, in the same state, is a spring of fresh water, which boils up from the bottom of a salt water creek, which runs nearly dry at low tide; but at flood tide is covered with water, directly from the ocean to the depth of three or four feet: yet in this situation by letting down a bottle well corked, through the salt water into the spring, and immediately drawing the cork with a string prepared for that purpose, it may be drawn up full of pure fresh water.

In the county of Hunterdon, near the summit of

the Muskonetkony mountain, is a noted medicinal spring, to which invalids resort from every quarter. It issues from the side of the mountain in a very romantic manner, and is conveyed into an artificial reservoir for the accommodation of those who wish to bathe. This water is a strong chalybeate, and has been sometimes used with great success.

There are several medicinal springs in Virginia, some of which are indubitably efficacious, while others may probably owe their reputation as much to fancy and change of air, as to their real virtues. However, as none of them have undergone a chymical analysis in skilful hands, nor been so far the subject of observations as to have produced a classification of the disorders they relieve, we can give little more than an enumeration of them.

The most efficacious of these, according to Mr. Jefferson, are two springs in Augusta, near the sources of James river, where it is called Jackson's river. The one is distinguished by the name of the Warm Spring, and the other of the Hot Spring.—The *Warm Spring* issues with a very bold stream, sufficient to turn a great mill, and to keep the waters of its basin, which is thirty feet in diameter, at the vital warmth, or 96 degrees of Fahrenheit's thermometer.—The matter with which these waters is allied appears to be very volatile; and from its smell, and the circumstance of its turning silver black, it is evidently sulphureous.

The *Hot Spring*, situated about six miles from the former, is much smaller, and raises the mercury in Fahrenheit's thermometer to 112 degrees, which is fever heat. A fountain of

common water issuing within a few inches of its margin, gives it a very singular appearance. These springs are much resorted to, notwithstanding a total want of accommodations for invalids. Their waters are strongest in the hottest months, which occasions their being visited principally in July and August.

The sweet springs are situated in the county of Botetourt, at the eastern foot of the Allegany mountains. Having been found to relieve cases in which the above mentioned springs had been ineffectually tried, their composition is supposed to be different. They differ also in their temperature, being as cold as common water.

On the Patowmac river, in Berkely county, are some medicinal springs, much more frequented than those of Augusta: but their waters are weakly mineralized, and scarcely warm. It is probable that many invalids prefer these springs to those of Augusta, as being situated in a fertile and populous country, perfectly secure from the Indians, and well provided with accommodations.

In the low grounds of the great Kanhaway, seven miles above the efflux of Elk river, is a large hole in the earth, from which incessantly issues a bituminous vapour, in so strong a current, as to give to the sand about its orifice the motion which it has in a boiling spring. On presenting a lighted torch or candle within eighteen inches of the aperture, the vapour flames up in a column of eighteen inches diameter and four feet in height, which sometimes burns out within twenty minutes, and at other times has been known to continue for upwards of three days. The flame is unsteady, and of the same density with that of burning spirits,

and smells like burning pit-coal. Water sometimes collects in the basin, which is remarkably cold, and is kept in ebullition by the vapour issuing through it; and it is a singular fact, that if the vapour be fired in this state, the water becomes hot, and evaporates in a very short time.

"The mention of uncommon springs," says Mr. Jefferson, "leads to that of Syphon fountains. There is one of these near the intersection of Lord Fairfax's boundary with the North mountain, not far from Brook's gap, on the stream of which is a grist-mill that grinds two bushels of grain at every flood of the spring. There is another near the Cow-pasture river, and about sixteen miles from the Hot Springs which intermits once in every twelve hours.

"After these may be mentioned the Natural Well in Frederick county. It is somewhat larger than a common well: the water rises in it as near the surface of the earth as in the neighbouring artificial wells; and its depth is unknown. It is said, there is a current in it, tending sensibly downwards. If this be true, it probably feeds some fountain of which it is the natural reservoir, distinguished from others, like that of Madison's cave, by being accessible. It is used with a bucket and windlass as an ordinary well."

There are five noted licks or salt-springs in Kentucky, viz. the higher and lower Blue-Springs on Licking river, from which issue streams of brinish water; The Big Bone lick, Drenon's lick, and Bullet's lick at Saltsburgh. The last of these springs has supplied Kentucky and Cumberland with salt, at twenty shillings per bushel, Virginia currency; and some is exported to the Illinois country.—The method of procuring water from

these licks, is by sinking wells from thirty to forty feet deep; and the water thus drawn is more strongly impregnated with salt than the water from the sea.

.. Springs that emit sulphureous matter have been found in several parts of Kentucky. One is near a salt spring in the vicinity of Boonsborough; and there are three springs of bitumen near Green river, which empty themselves into a common reservoir, and, when used in lamps, answer all the purposes of the best oil. It is said, that a man, near Lexington, having dug about six feet below the surface of the earth, came to a large flat stone, under which was a well of common depth, regularly and artificially formed.

In the county of Wilkes, in Georgia, is a medicinal spring, which rises from a hollow tree, about five feet in length. The inside of the tree is covered with a coat of nitre, an inch thick, and the leaves around the spring are encrusted with a substance as white as snow.—The water is said to be a sovereign remedy for the scurvy, gout, consumption, and every other disease arising from humours in the blood.—A person who had a severe rheumatism in his arm, having, in the space of ten minutes, drank two quarts of the water, experienced a momentary chill, and was then thrown into a perspiration, which, in a few hours, left him entirely free from pain and in perfect health.

This spring, being situated in a fine healthy part of the state, where there are excellent accommodations, must prove a pleasant and salutary place of resort for invalids from the maritime and unhealthy parts of this and the neighbouring states.

The lakes and other large bodies of water in North America are too numerous to be particula-

rized under the present section ; but we shall give a brief description of those which are most remarkable.

Lake Superior is so called from its magnitude, as being the largest on the continent. It may properly be termed the *Caspian* of America, and is supposed to be the largest body of fresh water on the globe. According to the French charts, it is fifteen hundred miles in circumference ; but Mr. Carver supposes that if the utmost extent of every bay were taken, it would exceed sixteen hundred. The water is pure and transparent, and appears throughout the lake to lie upon a bed of huge rocks. It is worthy of remark with respect to the waters of this lake, that although their surface, during summer, is very warm, yet on letting down a cup to the depth of about six feet, the water drawn from thence is excessively cold.

Though this lake is supplied by near forty large rivers, yet it does not appear that one tenth part of the waters conveyed into it is discharged through the only visible outlet. How such a superabundance of water can be disposed of, remains a secret; but it certainly has a passage through some unfathomable subterraneous cavities.—The entrance into the lake from the straits of St. Marie, affords one of the most beautiful prospects in the world. On the left appear many pleasant little islands ; and on the right is an agreeable succession of small points of land, that project a little way into the water, and contribute, with the islands, to render this delightful basen calm and secure from tempestuous winds.

Lake Huron, which is next in magnitude to Lake Superior, lies between forty-two and forty-six degrees of north latitude, and between four and ten

degrees of west longitude. Its shape is nearly triangular, and its circumference about one thousand miles.—On the north side of this lake is an island, one hundred miles long and only eight miles broad, which is called *Manataulin*, or “the place of spirits,” and is considered as sacred by the Indians. At the north-east corner, this lake communicates with Lake Michigan, by the straits of Michillimackinac; and it is a remarkable fact, that although there is no diurnal ebb or flood to be perceived in the waters of these straits, yet from particular attention to their state, a periodical alteration has been discovered. It seems they have been observed to rise by gradual but almost imperceptible degrees till in seven years and a half, they attained the height of about three feet, and in the same space of time they gradually subsided to their former state; so that in fifteen years they had completed this inexplicable revolution.

Lake Ontario is situated between forty-three and forty-five degrees of north latitude, and between one and four degrees of west longitude. Its form is nearly oval, and its circumference about six hundred miles. Near the south-east part it receives the waters of the Oswego river, and on the north-east it discharges itself into the river Iroquois, which, on reaching Montreal, takes the name of St. Lawrence.

Lake Erie, situated between forty-one and forty-three degrees of north latitude, and between three and eight degrees of west longitude, is nearly three hundred miles long, and above forty in breadth. A point of land projects from the north side into the water, several miles towards the south-east, and the islands and banks towards the western extremity are so infested with rattle-snakes, as to render landing upon them extremely dangerous. This

lake is of a more dangerous navigation than any of the others, on account of the craggy rocks which project into the water, in a perpendicular direction, many miles together, affording no shelter from storms.

About six leagues from the fort of Niagara, in Canada, is the greatest cataract in the world, known by the name of the *Waterfall of Niagara*. The river at this fall runs from S. S. E. to N. N. W.; and the rock of the fall, forms a kind of figure like a hollow semicircle or horse-shoe. Above the fall, in the middle of the river, is an island about eight hundred feet long; the lower end of which is just at the perpendicular edge of the fall. Before the water comes to this island, it runs but slowly compared with its motion afterwards, when it grows extremely rapid, running with a surprising swiftness before it comes to the fall. It is perfectly white, and in several places is thrown high up into the air. The water that runs down on the west side is in greater abundance and whiter than that on the opposite side; and seems almost to outfly an arrow in swiftness. When a person is at the fall and looks up the river, he may perceive that the water is every where exceedingly steep, almost like the side of a hill; but on looking at the fall itself, it is impossible to describe the astonishment it occasions.

The height of the cataract, as measured by mathematical instruments, is found to be exactly a hundred and thirty-seven feet; and when the water is come to the bottom it flies back to a great height in the air. The noise may sometimes be heard at the distance of forty miles, but seldom farther. At some times the fall makes a much greater noise than at others; and this is regarded

as an infallible prognostic of rain or other bad weather.

From the place where the water falls there arises a prodigious vapour, like a thick smoke, insomuch than when viewed at a distance, a stranger might suppose, that the Indians had set their forests on fire. These vapours rise very high in the air when it is calm, but are dispersed by the wind when it blows hard. If any person go into this vapour, or if the wind blow it on him, it is so penetrating, that in a few moments he will be as wet as if immersed in water.

Some persons are of opinion, that when birds happen to fly into the smoke of the fall, they immediately drop down, and perish in the water; either because their wings are become wet, or that the tremendous noise of the fall astonishes and confounds them: but others think that this idea is merely chimerical; because among the great numbers of birds found dead below the fall, there are no other sorts than such as live and swim frequently in the water, as swans, geese, ducks, teal, &c. Great flocks of these animals are often seen going to destruction in the following manner:—They swim in the river above the fall, and so are carried down lower and lower by the water; and as water-fowl are commonly pleased with being carried by the stream, they indulge themselves in this pleasure, till the rapidity of the water renders it impossible for them to rise, and they are consequently hurried down the precipice.

In the months of September and October, such prodigious quantities of dead water-fowl are found every morning below the fall, that they afford ample subsistence for the garrison at the fort. Here also are frequently found the bodies of deer, bears,

and other animals, which have attempted to cross the water above the fall. Some melancholy instances of human beings having lost their lives in a similar manner, are related by travellers; and the following one is too affecting to be passed over in silence.—

"An unfortunate Indian was reposing, in a state of inebriety, in his canoe, which was properly secured, at the distance of some miles above the cataracts, while his wife sat on the shore to watch his slumbers. After some time, a sailor, from one of the vessels on the lake, happened to arrive at the spot, and began to take some indecent liberties with the Indian female. The woman naturally attempted to rouse her husband, but before she could effect her design, the brutal mariner cut the cord of the canoe and set it adrift. The little vessel glided swiftly down the stream, and in the space of a few minutes it was seen to enter the Rapids. The Indian, awakened by the violent motion of the waves, started up, and on perceiving his perilous situation, he grasped his paddle with a look of inexpressible horror; but finding it absolutely impossible to stem the force of the current, he calmly wrapped himself up in his blanket, and resumed his former position at the bottom of the canoe. In the space of a few moments, he was hurried down the precipice, and was never discovered more."

There is an island in the middle of the fall, which was formerly supposed inaccessible; but an accident that happened about sixty years ago made it appear otherwise. Two Indians went out from Fort Niagara to hunt upon an island that is situated in the middle of the river, above the great fall, which was then stocked with abundance of deer;

but having indulged too freely in the use of some French brandy, they fell asleep, and then came down back with the stream. They crossed that island which is in the middle of the river. Here they were awoken by the noise of the cataract, and began to give themselves over as lost; but after some vigorous exertions, they effected a landing upon the island. At first they existed in the idea of their escape; but upon cool reflection they found themselves hardly in a better state than if they had gone down the falls, since they had no other alternative than either to swim across the river down the same, or return with danger. After some time, however, hard necessity put them to an invention; and as they could not lay hold of wood on the island, they made a ladder of the bark of the lind tree, in order to reach the water below. One end of this ladder they fastened to a large tree that grew on the side of a rock above the fall, and at the other end down to the water. By this contrivance they descended to the bottom in the middle of the fall; and then threw themselves out into the water, thinking to swim on shore. Sadly, however, had they begun to swim, because they were thrown back with violence against the rock from which they came, and after several successive attempts, they were compelled to cascade to the island. After some time they discovered a man on the shore, who appeared to have a long staff or tree, but gave them little hope of assistance. These, however, ran to him from the cataract, and took the top of the staff in order to aid them; and so soon prodded the maws of the cataract, as to bring it to a stand.

The water that runs on the cataract is very rapid, and is shallow, especially toward the bottom;

shore. The commandant, therefore, caused some poles to be made and pointed with iron, and by the help of these, two Indians offered to walk to the island to save their unfortunate brethren or to perish in the attempt. Each had two such poles in his hands to set to the bottom of the stream in order to keep him steady, and in this manner they safely reached the island, and brought away the poor creatures, who were almost perishing for want of food.

On the west side of this island are some small rocks; and in former times, a part of the rock at this side of the fall hung over in such a manner, that the water which fell perpendicularly from it left a vacancy below, so that people could go under, between the rock and the water; but, some years ago, the prominent part broke off and fell down. The breadth of the fall, as it runs in a semicircle is reckoned to be about three hundred feet.

Every day when the sun shines, from ten o'clock in the morning till two in the afternoon may be seen, below the fall, the similitude of a beautiful rainbow, and sometimes two, one within another. The brightness and clearness of this phenomenon depends on the quantity of vapour that results from the spray of the cataract; for when the wind drives the vapours away the rainbow disappears; but as soon as new vapours come, it resumes its former appearance. The rock of the fall consists of a grey lime-stone.

What are called the great cohoes falls of the Mohawk river, have also a surprising appearance. The river is near, a quarter of a mile broad, and the water, precipitating itself from several rocks which project from the rest, falls down on every side them in torrents, and being broken near the

bottom by many separate crags, rises in a white froth. The descent is here said to be about seventy feet, in which height are probably included the steep descents just below the above disjointed precipice; from whence also rises a misty cloud, that descends like small rain, and exhibits, when the sun shines, a beautiful rainbow, which moves as the spectator moves, according to the angle of vision. Misson relates the same of a mist arising from the cataract of Velino in Italy; and another author notices a similar phenomenon at the cataract of Narva in Livonia. We also read of marine rainbows, sometimes observed in a much agitated sea, when the wind sweeps away the tops of the waves, and carries them aloft, so that the sun's rays falling on them are refracted, as in a common shower, and paint the colours of the bow, but less distinct and of less duration.

ANTIQUITIES.

The ancient city of Mexico, as it stood on the same ground the present city stands on, was probably square, or pretty near that figure; and its dimensions may be guessed at from the number of families residing in it, which the histories of that conquest make to be about sixty thousand. There was a noble square in the middle of the city, which, at the time of the great fair, was resorted to by a prodigious concourse of people, and contained a great number of booths and tents wherein they lodged their merchandise. The city was divided into two parts; the one inhabited by the court, the nobility, and persons of distinction; the

ther by tradesmen and people of inferior rank. The former part was much the largest, where the streets were spacious, the houses of white hewn stone, one story high, and they had flat roofs, adorned with battlements. Their cielings were of cedar, cypress, or other odoriferous wood ; and their hangings either of furs and beautiful feathers, or cotton linen, painted with a variety of figures of plants and animals : but, notwithstanding their wealth, none of the nobility were served in plate, which was the prerogative only of the emperor.

The palace of Montezuma, the last emperor, was so very large, that it had thirty gates, which opened into as many different streets, the principal front making one side of the above mentioned square. The materials of this building were polished jasper, black, red, and white ; and over each gate were the arms of Montezuma, being a griffin with the wings extended, and a tyger in its talons. The whole consisted of several square courts, and was so vastly extensive as to contain apartments for three thousand of the emperor's women, and a proportionable number of domestics. Another palace assigned to Cortez and his army was likewise of a surprising extent, containing commodious rooms and apartments for five hundred Spaniards, and six thousand Indian auxiliaries ; and, when the Spanish general had planted his artillery, and placed his guards, it had much the appearance of a fortress, being surrounded with a thick stone wall, and gilded with towers.

When Cortez and his army first entered the streets of Mexico, they were met by two hundred noblemen of the emperor's household, clothed in one livery, with large plumes of feathers on their heads, all of the same fashion and colour. These,

after meeting and paying their compliments to the Spanish general, fell back, and then dividing themselves made a lane for the Spaniards. Then came another body of the nobility of a superior dignity, who made a more splendid appearance ; and in the midst of them was the emperor Montezuma, carried in a chair of beaten gold, on the shoulders of his favourite courtiers, whilst four of them sustained a canopy over his head. The whole was adorned with beautiful feathers, through which the gold appeared predominant, and the emperor was preceded by three officers with rods of gold, the harbingers of his approach, on whose appearance the people fell upon their faces, not daring to look upon their monarch. Cortez dismounting when the Mexican emperor drew near, the latter alighted from his chair, and carpets were spread in the streets for him to tread on. He advanced, with a solemn slow pace, leaning on the arms of two princes his relations, and was met by Cortez with a profound reverence, which the emperor answered by touching the ground with his hand, and afterwards raising it to his lips ; which was looked upon as a great condescension, and added to the esteem and veneration his subjects already had for the Spaniards. The conference between the Mexican emperor and Cortez was short at this interview, after which Montezuma commanded one of his princes to conduct the general to the palace appointed for his residence, and then returned to his own.

Besides the two palaces already mentioned, Montezuma had several pleasure houses in and about the city ; in one of which were great galleries, supported by pillars of jasper, and stored with all sorts of land-fowl and birds that Mexico

roduced. The sea-fowl were preserved in reservoirs of salt water; and those that were bred up in lakes and rivers, in others of fresh water. And so numerous were these fowl, that it is said to have been the business of three hundred men to look after them. In one square of the palace were kept all manner of wild beasts in their respective dens or cages, in a most regular order. In another square of the same palace were apartments for dwarfs and monsters, fools and naturals, of the human species, kept for the diversion or service of the court. Here were also armouries, well stored with all sorts of Indian weapons; and the artificers that formed and cleaned these arms, had apartments in the same quarter.

All these palaces of the Mexican emperors had spacious and elegant gardens, laid out in shady walks, beds of fragrant and medicinal herbs, and parterres of beautiful flowers, and embellished with magnificent summer-houses, baths, arbours, and fountains. But there was a building in the most solitary part of the gardens, which surprised the Spaniards more than any thing they met with, and it was called the House of Sorrow, because the emperor used to retire thither on the death of his relations, or on any calamity, public or private. The roof, the cieling, and the sides were black, and only just so much light was admitted as to discover the dismal obscurity. In this gloomy mansion, the Spanish authors pretend that Montezuma used to converse familiarly with the prince of darkness.

The principal of the Mexican temples was dedicated to Viztlipuzli, the god of war. The whole edifice formed a large square, and was encompassed by a wall of hewn stone, and adorned

on the outside with knots of twisted serpents. At a little distance from the chief gate was a place of worship, built of stone, having an ascent of thirty steps, which led to a long flat roof, and the front of it (as the Spaniards relate) was decorated with the skulls of men who had been sacrificed to the idols. On each side of the square was a magnificent gate, and over every one of them four statues, supposed to represent some subordinate deities. At the foot of the wall within were the apartments of the priests, and of their inferior officers and servants; and yet there was room enough left for eight or ten thousand persons to dance on solemn festivals. In the middle of the square was a structure of a pyramidal form; three sides whereof were smooth, and the fourth ascended by a hundred and twenty steps. There was a terrace on the top, forty feet square, laid with jasper of different colours. This was surrounded with twisted rails, and on each side was a marble statue, supporting a large candlestick, between which was a green stone, five spans high from the ground, which terminated in a point; and on this, it is said, they extended the human victims they sacrificed, throwing them on their backs, and ripping them open with sharp flints instead of knives; after which they tore out their hearts, and offered them to their idols.

On the farther side, opposite to the stairs, stood a chapel of exquisite materials and architecture, where an idol was placed above an altar. This image was of human form, and set on a throne, sustained by an azure globe, which they called heaven; and from the sides of it issued four rods, whose ends resembled the heads of serpents. On the head of the image was a helmet, adorned with

plumes of various colours; and its countenance was severe and terrible. In the right-hand it held a twining serpent, which served for a staff; and in the left-hand four arrows, which were revered as the gift of Heaven. It likewise bore a shield, adorned with fine white plumes in form of a cross.—On the left-hand was another chapel, in which was the image of Tlalock, another of the Mexican deities, almost in every respect resembling the former. These two idols were so intimately united, in the opinion of the poor Indians, that they ascribed to them the same attributes, and paid them the same honours. The walls and altars of these chapels were immensely rich, being covered with jewels and precious stones, set on feathers of various colours. There were eight of these temples in Mexico, of similar architecture and equal wealth; besides two thousand small ones, dedicated to so many different gods, every street having its tutelar deity, every distress or calamity its particular altar.

On an island in the lake, about two leagues from Mexico, was situated Iztacpalapa, the two cities having a communication by a spacious stone causey. This town consisted of ten thousand houses, many of which were built like those of Mexico. The rooms of the Cacique's palace were hung with cotton-linen, finely painted; and among the curiosities in his garden, he had a square reservoir, with stairs to go down to the bottom, each side being four hundred paces.

Another city called Cholula, was for beauty like Valladolid in Spain, containing twenty thousand souls, and having suburbs of equal dimensions.

The city of Tlascala was also built with

stone and brick, like the houses of Mexico, and was situated on four eminences, which were united and defended by a stone wall: so well were the Mexicans skilled in architecture in those days, though now there are not any towns in the country built of brick or stone, except those in possession of the Spaniards.

As to the Indian antiquities about Mexico, the Spaniards have destroyed the greatest part of them, but about seven leagues from the city there still remain two remarkable pieces, viz. the pyramids of the sun and moon, the founders of which are not known. They appear cut out in steps like those of Egypt; and on the top of them formerly stood two images of a monstrous size, representing the sun and moon, which the Indians worshipped. The pyramid of the sun stands about two hundred paces from the other, and is about a fourth part higher.

On a high hill near the Tyoga river in Pennsylvania, are to be seen the remains of a very ancient fortification, which is of a circular form, and encompassed by an intrenchment. From appearances it is conjectured that pits were sunk in several places, and lightly covered over, so as to decoy the assailants in case of an attack, and defeat their attempts in storming the works. The entrenchment only remains; but it seems to have been formerly stockaded.—The natives are entirely ignorant of the origin of these works, but suppose they were erected by the Spanish Indians.—The hill is an excellent station for a fort, and commands a delightful view of the circumjacent country. There is another fortification of a similar kind at Una-dilla.

The number of old forts found in the Kentucky

country, in the Western Territory, are the admiration of the curious, and afford ample matter for speculation. They are generally of a circular form, situated on well chosen ground and contiguous to water. When, or by whom, these were thrown up, cannot now be ascertained; but they are certainly very ancient, as there is not the least visible difference in the age or size of the timber growing within these forts, and that which grows without; and even the oldest natives have lost all tradition concerning them. They must have been the work of a people much more devoted to labour than the present race of Indians; and it is difficult to conceive how they could be constructed without the use of iron tools. At a convenient distance from each of these works stands a small mount of earth, thrown up in the form of a pyramid, and in some measure proportioned to the size of the adjacent fortification. On examination, these mounts have been found to contain a chalky substance, supposed to be human bones.

Barrows, or sepulchral mounts, are also found in other parts of America. These, according to Mr. Jefferson's account, are of various sizes, and different materials; some of them being constructed of earth, and others of loose stones. That they were depositaries of the dead is sufficiently obvious, though the time and origin of their construction are now enveloped in impenetrable obscurity. Some have supposed, that they covered the bones of those who have fallen in battles fought on the spot of interment. Some ascribe them to the custom, said to prevail among the Indians, of collecting, at certain periods, the bones of all their deceased friends, wheresoever deposited at the time

of their decease. Others again have supposed them the general sepulchres of towns, conjectured to have stood on these grounds; and this opinion was supported by the quality of the lands in which they are found, and by an old tradition, that when the aboriginal Indians settled in a town, the first person who died was placed erect, and earth put about him, so as to cover and support him; that when another died, a narrow passage was dug to the first, the second reclined against him, and the cover of earth replaced, and so on.

" There being one of these barrows in my neighbourhood," says Mr. Jefferson " I wished to satisfy myself which of these opinions was just; and for this purpose, I determined to open and examine it thoroughly. It was situated on the low grounds of the Rivana, and opposite to some hills, on which had formerly stood an Indian town. It was of a spheroidal form, about forty feet diameter at the base, and had been about twelve feet high, though now reduced by the plough to seven feet and a half, having been under cultivation about a dozen years. Before this, it was covered with trees of twelve inches diameter, and round the base was an excavation of five feet depth and width, from whence the earth had been taken to form the hillock.

" I at first dug superficially in several parts, and came to collections of human bones, at different depths, from six inches to three feet below the surface. These were lying in the utmost confusion, some vertical, some oblique, some horizontal, and directed to every point of the compass, entangled and held together in clusters by the earth. Bones of the most distant parts were found together, as,

for instance, the small bones of a foot in the hollow of a skull; and several skulls were sometimes seen in contact, lying on the face, on the back, top, or bottom, so as to give the idea of bones emptied promiscuously from a bag, or basket, and covered over with earth, without any attention to their order. The bones of which the greatest numbers remained, were skulls, jaw-bones, teeth, the bones of the arms, thighs, legs, feet and hands. A few ribs remained, and some vertebræ of the neck and spine without their processes; but there was only one instance of the bone which serves as a base to the vertebral column. The skulls were so tender, that they generally fell to pieces on being touched; but the other bones were stronger.

" There were some teeth which were judged to be smaller than those of an adult; a skull which on a slight view, appeared to be that of an infant, but it fell to pieces on being taken out, so as to prevent satisfactory examination; a rib and a fragment of the under jaw of a person about half grown; another rib of an infant; and part of the jaw of a child, which had not cut its teeth. This last furnishing the most decisive proof of the burial of children here, I was particular in my attention to it. It was part of the right half of the under jaw. The processes by which it was articulated to the temporal bones were entire; and the bone itself firm to where it had been broken off, which seemed to be about the place of the eye-tooth. Its upper edge, wherein would have been the sockets of the teeth was perfectly smooth. Measuring it with that of an adult by placing their hinder processes together, its broken end extended to the penultimate grinder of the adult. This bone was white, all the others of a sand colour. The bones of in-

fants being soft, they probably decay sooner, which might be the cause so few were found here.

" I proceeded then to make a perpendicular cut through the body of the barrow, that I might examine its internal structure. This passed about three feet from its centre, was opened to the former surface of the earth, and was wide enough for a man to walk through, and examine its sides. At the bottom, that is on the level of the circumjacent plain, I found bones; above these a few stones, brought from a cliff a quarter of a mile distant; then a large interval of earth, then a stratum of bones, and so on. At one end of the section were four strata of bones plainly distinguishable; at the other three; the strata in one part not ranging with those in another. The bones nearest the surface were least decayed. No holes were discovered in any of them, as if made with bullets, arrows, or other weapons. I conjectured that in this barrow might have been a thousand skeletons.

" The circumstances above related militate against the opinion that this place was designed to cover the bones only of persons fallen in battle; and against the tradition also which would make it the common sepulchre of a town, in which the bodies were placed upright, and touching each other. Appearances certainly indicate that it has derived both origin and growth from the accustomary collection of bones, and deposition of them together; thus, the first collection had been deposited on the common surface of the earth, a few stones put over it, and then a covering of earth; that the second had been laid on this, had covered more or less of it in proportion to the number of bones, and was then also covered with earth, and so on.

"The following are the particular circumstances which give it this aspect. 1. The number of bones. 2. Their confused position. 3. Their being in different strata. 4. The strata in one part having no correspondence with those in another. 5. The different states of decay in these strata; which seem to indicate a difference in the time of inhumation. And 6. the existence of infant bones among them. But on whatever occasion these barrows may have been made, they are of considerable notoriety among the Indians; for a party passing, several years ago, through the part of the country where this barrow is, went through the woods directly to it, without any instructions or enquiry; and having staid about it some time, with expressions which were construed to be those of sorrow, they returned to the high road, which they had left about half a dozen miles to pay this visit, and pursued their journey.

"There is another barrow, much resembling this in the low grounds of the south branch of Shenandoah, where it is crossed by the road leading from the Rock-fish-gap, to Staunton. Both of these have, within these dozen years, been cleared of their trees, and put under cultivation; are much reduced in height and spread in width by the plough; and will probably disappear in time. There is another barrow on a hill in the blue ridge of mountains, which is made up of small stones thrown together; this has been opened, and found to contain human bones, as the others do."

BUILDINGS.

THE famous city of Mexico, which is an archbishop's see, and the residence of a Spanish Viceroy, stands on a lake of its own name, on the east side of a valley, at the foot of a ridge of hills; and is only to be approached by five causeys; but has no gates, walls, nor artillery. It is one of the most regularly built cities in the world, the streets being straight, and crossing one another at right angles, and in the narrowest of them three coaches may go abreast. It is almost quadrangular; being more than five miles one way, and little less than four the other, and contains about a hundred thousand inhabitants, many of them immensely rich; the most valuable commodities of the East and West Indies, as well as Europe, being daily exposed to sale in their market-place, which is a spacious square in the middle of the city. The houses are built of brick and stone, but not very high, the country being subject to earthquakes; and as all the edifices are very convenient, so some of them are very magnificent, especially the cathedral, which was sixty years in building, and is embellished with the finest painting, gilding, carving, and other ornaments. This structure, with the cloysters and dwellings of the clergy adjoining to it, takes up a large space of ground; and the revenues belonging to it are equal to the beauty and magnificence of the buildings. The high altar is said to have cost fifty thousand pieces of eight, each piece about four shillings and sixpence English; and the chalice for the ordinary service eleven

thousand, being of gold engraved, and set round with rubies. There is also an image of the Virgin Mary, which is of massy silver, adorned with rubies and pearls to the value of thirty thousand pieces of eight, and which is annually carried in procession, when a certain number of maids draw lots, for three hundred pieces of eight for their portions.

Besides the cathedral there are about thirty other fine churches, twenty-two convents of both sexes, and several hospitals richly endowed. The revenue of the cathedral is at least seventy thousand pounds per annum, of which the archbishop has fifteen thousand, besides a great many fines and other perquisites.

The great square or market-place already mentioned, has a piazza on one side of it; under which are some of the richest shops in the world; and on the opposite side stands the magnificent palace of the viceroy, which was re-built in the year 1698, and whose principal front is not inferior to that of the palace at Naples, which it resembles, particularly in its noble stair-case, leading to a great number of beautiful apartments: and yet the archbishop's palace, which is built round like a theatre, is reckoned a more stately and elegant structure than that of the viceroy.

Next to this great square is a street called the Plateria, inhabited by goldsmiths and silversmiths, whose shops are furnished with such a variety of utensils and ornaments of gold, silver, and jewels, as perhaps cannot be paralleled in any other city in the world: for here even the Negro women that walk by the ladies coaches wear bracelets of gold, pearl necklaces, and jewels in their ears; and the black foot-boys are

dressed in rich liveries, trimmed with gold and silver lace. Here they are continually making either church or family plate, especially when the merchants are bespeaking goods against the arrival of the galleons; at which time the shops and warehouses are filled with chests of plate designed for Spain, piled up to the very ceilings. The glasses or sashes, like those of our goldsmiths, are full of gilt plate, and their cabinets are filled with vast quantities of rings, pearls, large jewels, numberless toys, especially gold snuff-boxes, enamelled and set with rubies and emeralds, of which it is said ten thousand are sometimes to be seen in this street, and hardly a fleet departs for Spain without carrying off at least five hundred.

The street where the mercers expose their silks, has a very grand appearance; and that where the tradesmen reside, who deal in brass, steel, and iron ware, is very long and spacious: but the street inhabited by the nobility, gentry, and lawyers, without any shops intermixed, exceeds all the rest for stately buildings, the principal of which is the fine palace of the Marquis del Valle, the successor of Cortez, who conquered Mexico, which stands on the ground where the palace of the emperor Montezuma stood, and is deservedly admired for its structure and dimensions.

There is in Mexico, a pleasant ring or park, planted with trees, and adorned with fountains and water-works, whither the quality of both sexes, and the gay part of the town, resort every evening. Several hundreds of coaches are frequently seen here, most of them with fine equipages, and a great number of pages

and other servants, of whom the former are generally Negroes. The ladies are said to be great gamesters; but the chief diversion for people of all ranks is in canoes upon a fine canal, the banks whereof are furnished with vast varieties of dainties for their accommodation. Others divert themselves with fishing in boats upon the lake, carrying along with them wine and cold provisions. The neighbourhood of the city is rendered extremely pleasant by the numerous villages, monasteries, palaces, country seats, &c. which either stand on islands, or on the banks of the lake. The best water is brought to town by an aqueduct from a mountain several miles distant.

Near the beginning of this aqueduct is Chapultepec, the burial-place of the Spanish viceroys, as it was, formerly of the Mexican emperors. Here is a sumptuous palace, with fine gardens and water-works, and a beautiful chapel, the ornaments of which are reckoned to have cost above a million of crowns.

New Orleans, the capital of Louisiana, is situated on the east side of the Mississippi, in thirty degrees two minutes north latitude. Some years ago, it contained about eleven hundred houses, seven eighths of which were consumed by fire, in the space of five hours, on the 19th of March, 1788. But it is now fast rebuilding. Its advantages for trade are very great. Situated on a noble river, in a fertile and healthy country, within two weeks sail of Mexico, and still nearer to the West India islands, there seems a certainty of its becoming the general receptacle for the produce of that extensive and valuable country on the Mississippi and Ohio.

St. Augustine, the principal city of East Florida, is pleasantly situated on the sea-coast. It is of an oblong figure, intersected by four streets, which cut each other at right angles. The town is fortified with bastions, and enclosed with a ditch: it is likewise defended by a castle, called Fort St. John, which is well furnished with ordnance. The north and south breakers at the entrance of the harbour form two channels, whose bars have eight feet water.

The principal town in West Florida is Pensacola. It lies along the beach, and, like St. Augustine, is of an oblong form. The water approach to the town, except for small vessels, is obstructed by a low and sandy shore. The bay, however, on which the town stands, forms a very commodious harbour, and vessels may ride here secure from every wind.

Portsmouth, the largest town in New Hampshire, is seated on the south-east side of Piscataqua river, and contains about six hundred houses. Its public buildings are a court house, two churches for congregationalists, one for episcopalians, and one other edifice for public worship. Its harbour is one of the finest on the continent, having a sufficient depth of water for vessels of any burden. It is defended against storms by the adjacent land in such a manner, that ships may securely ride there in any season of the year. A light-house, with a single light, stands at the entrance of this harbour; and its vicinity to the sea renders it very convenient for naval trade.

Dartmouth college, in the western part of this state, is situated on a beautiful plain, about half a mile east of Connecticut river, and is one

of the most flourishing seminaries in the United States. The library is very elegant, and contains a large collection of the most valuable books; and its apparatus consists of a competent number of useful instruments, for making mathematical and philosophical experiments. There are three structures for the use of the students, one of which, erected in 1786, is a hundred and fifty feet long, and fifty broad, three stories high, and handsomely built. It has a broad passage-running through its centre from end to end, intersected by three others. In front is a large green, surrounded by a number of handsome houses.—This college was founded by the late pious Dr. Wheelock, who, in 1769, obtained a royal charter, wherein ample privileges were granted, and suitable provision made for the instruction of youth of the Indian tribes, and also of English youths and any others. The humane attempts which have been made to civilize and educate the Indians has not been crowned with the expected success, but in other respects it has proved very useful. It has, in the four classes, about a hundred and thirty students, under the direction of a president, two professors, and two tutors; and it has also twelve trustees, who are a body corporate, invested with all the powers necessary for such a body.

Boston, the capital of Massachusetts, is built on a peninsula of an irregular form, at the bottom of Massachusetts Bay. The length of the town is nearly two miles, and it is said to contain about eighteen hundred dwelling houses.—Here are sixteen edifices for public worship; of which nine are for congregationalists, three for episcopalians, two for baptists, one for quakers, and one for in-

dependents. The other public structures are the state house, Faneuil hall, an alms house, a work-house, and a bridewell. That building which was formerly the governor's house, is now occupied in its several apartments, by the council, the treasurer, and the secretary. The public granary is converted into a store, and the linen manufactory house is now occupied by the bank. Most of the public buildings are handsome, and some of them are elegant.—On the west side of the town is the mall, a very beautiful public walk, adorned with rows of trees, and in view of the common, which is always open to refreshing breezes.

The principal bridge in this, or in any of the United States is that which was built over Charles river, between Boston and Charleston, in the year 1786. This structure is fifteen hundred and three feet in length, being built on seventy five piers, and having a draw of thirty feet in width. The abutment at Boston to the old landing is forty-five feet and a half, and that at Charleston, from the old landing is a hundred feet.

Each pier consists of seven sticks of oak timber, united by a cap-piece, strong braces; and girts ; driven into the bed of the river, and secured by a single pile on each side, driven obliquely to a solid bottom. The piers are also connected to each other by large string pieces, covered with four-inch plank. The bridge has a gradual rise from each end, so as to be two feet higher in the middle than at the extremities : it is about forty-three feet in width, and on each side is a passage six feet wide, railed in, for the safety of foot passengers. Forty elegant lamps are

erected at a suitable distance from each other, to illuminate it when necessary.

The draw is constructed on a capital plan : the machinery is very simple, and it requires the strength of two men only in raising it. The floor on the bridge, at the highest tides, is four feet above the water, which generally rises about twelve or fourteen feet.

" This bridge," says Dr. Morse, " was completed in thirteen months ; and while it exhibits the greatest effect of private enterprize within the United States, it is a most pleasing proof how certainly objects of magnitude may be attained by spirited exertions."

Harvard University is situated in the village of Cambridge, about four miles from Boston, and consists of four elegant brick edifices, handsomely enclosed. The names of these buildings are, Harvard-Hall, Massachusett's-Hall, Holle's-Hall, and Holden Chapel.—Harvard-Hall is divided into six apartments ; one of which is appropriated for the library, one for the museum, two for the philosophical apparatus, one for the chapel, and the other for a dining hall. The library, in 1787, consisted of twelve thousand volumes, and is continually increasing both from casual benefactions, and from the interest of permanent funds. The philosophical apparatus belonging to this university cost between fourteen and fifteen hundred pounds, and is the most complete and elegant of any in America. This university received its first charter in 1650.

Newport, the principal town of Rhode Island contains about a thousand dwelling houses, built chiefly of wood, and it has nine places of public worship, viz, three for baptists, two for congre-

gationalists, one for episcopalians, one for quakers, one for Moravians, and a synagogue for the Jews.—The other public edifices are a state house and the public library.—The situation, form, and architecture of the state house, give it the preference to most public buildings in America. It stands finely elevated, and a long wharf and paved parade lead up to it from the harbour. The building for the library consists of one spacious room, thirty-six feet long, twenty six feet broad, and nineteen high, where the books are kept, with two small offices adjoining. The principal front consists of a pediment and portico of four Doric columns, the whole entablature of which runs entirely round the building. The two offices appear like wings, one on each side of the portico, and are connected with the body of the building so as to form two half pediments, proceeding from the lower part of the entablature. The east front consists of a plain Doric pediment, supported by a rustic arcade of three arches, in the recesses of which are placed three Venetian windows. The outside of this edifice is entirely of rustic work, and stands on a base five feet from the ground: the entrance is by a flight of steps, extending the whole width of the portico. This elegant building, however, is now much out of repair, and a considerable part of the books were either destroyed or carried off from the library during the war with Great Britain.

The city of New Haven, in Connecticut, covers part of a large plain, which is bounded on three sides by high hills. It was originally laid out in squares of sixty rods, but many of these have been divided by cross streets.—Near the

centre of the city is the great square, around which are the state-house, a college and chapel, three churches for congregationalists, and one for episcopalians, which are all handsome and commodious buildings.

Several of the streets are ornamented with rows of trees, which give the city a rural appearance ; and the prospect from the steeples is peculiarly beautiful. The houses are principally of wood ; but they are well built, and in some instances tolerably elegant.

Yale College, at New Haven, is a brick edifice, about a hundred feet long, and forty feet wide. It is three stories high; and contains thirty two chambers and sixty-four studies, convenient for the reception of a hundred students. The college chapel, which is also of brick, is fifty feet long by forty in breadth, and has a steeple a hundred and twenty-five feet high. In this building is the public library, consisting of about two thousand five hundred volumes ; and the philosophical apparatus.—The college museum, to which additions are constantly making, contains some great natural curiosities.

New York, the capital of the state of the same name, is seated on the south-west point of an island at the confluence of the Hudson and East Rivers. Its length on East River is about two miles, but it falls short of that extent on the banks of the Hudson. Its breadth, on an average, is nearly three fourths of a mile ; and its circumference is about four miles. The houses, for the most part, are built of brick, and the roofs tiled. There are remaining a few houses built after the old Dutch manner ; but the English style of architecture has prevailed for almost a century. Upon the south-

west point of the land stands the fort, which is a square with four bastions ; and the battery, in the summer season, furnishes the citizens with an agreeable walk, which is open to refreshing breezes from the bay.

The city-hall is a brick edifice, three stories in height, with wings at each end ; but it is rather strong than elegant. The first floor is an open walk, excepting two apartments for the porter and the city watch. In the second story of the eastern wing is the assembly chamber, adorned with the following paintings :—The portrait of Columbus, a painting valuable only for its antiquity and the character of the man. The likenesses of the late king and queen of France, executed in a most masterly manner and presented to Congress by his most Christian majesty. And a portrait of General Washington, presented by a gentleman of England. The western wing contains a room for the council or senate, and another for the mayor's court ; and in the body of the edifice is a spacious hall, for the supreme judicial court.

There are four presbyterian churches in this city. The first was erected in the year 1719, built of stone, and rebuilt in 1748 : it is about eighty feet long, and sixty wide, with a cupola and bell ; and stands in the upper end of Wall-street, near the Broad-way. The second, erected in 1767, is a handsome brick building, eighty-three feet long, and sixty-five wide : it stands on the east side of the green at the head of Beckman street. The third was erected in 1768, and is a neat stone building, about sixty-five feet long, and fifty-five wide, and stands in Little Queen Street. These three churches were occupied by the British troops, during the late war, as hospitals and barracks, and

were left in a very ruinous situation ; but they have been all repaired, since the peace, at the expence of their respective congregations. The fourth presbyterian church was erected in Nassau street in 1787, and is a neat frame building, about sixty feet long, and twenty-four feet wide.

There are three episcopal churches in New York, under one charter, which was granted in the year 1697. Trinity church was situated on the west side of Broad-way, with a spacious cemetery on each side : it was about a hundred and forty-eight feet in length, and seventy-two in breadth, including the tower and chancel, and the steeple was a hundred and seventy-feet in height. This was supposed to be the most stately building of the kind in America ; but it was unfortunately destroyed in the conflagration which happened just after the British troops entered the city in 1776. However, it has been recently rebuilt, at a very considerable expence. St. George's chapel in Beckman street, erected in 1750, is a very neat building, formed with hewn stone, and the roof tiled. St. Paul's chapel in Broad-way, which was completed in 1766, is also a handsome edifice, and has been embellished, by order of Congress, with a superb monument to the memory of General Montgomery, who fell in the attack of Quebec, December 31, 1775. There are several other places of worship in this city for different sectaries.

Trenton, the principal town of New Jersey, is situated on the north-east side of the river Delaware, nearly in the centre of the state. This town, with Lambertton, which joins it on the south, contains about two hundred houses, and is tolerably populous. Here the legislature meets, the supreme court sits, and most of the public offices are kept ;

for which reasons it is considered as the capital of the state. In the vicinity are several gentlemen's seats, finely situated on the banks of the Delaware, and ornamented with great taste and elegance.

The college of Princeton, in this state, is handsomely built with stone, and is a hundred and eighty feet long, fifty-four feet broad, and four stories high. It is divided into forty-two convenient chambers for the accommodation of the students, besides a dining hall, a chapel, and a room for the library. The situation of this college is exceedingly healthy, and the view from the balcony is truly charming. This college has been under the care of a succession of very able presidents, and has furnished a great number of civilians, divines, and physicians of the first rank in America.

Philadelphia, the capital of Pennsylvania, is situated on the west bank of the Delaware, on an extensive plain, about a hundred and eighteen miles from the sea ; and contains about five thousand houses, which, for the most part, are handsomely built. The places for religious worship are as follow :—The quakers have five, the presbyterians six, the episcopalians three, the German Lutherans two, the catholics three, and the German Calvinists, the Swedish Lutherans, the Moravians, the Methodists, the Baptists, the Universal Baptists, and the Jews have one respectively.

The state house is in Chesnut-street, and was erected in the year 1735 : it is rather magnificent than elegant. The state-house yard is an elegant and spacious public walk, ornamented with several rows of trees, but a high brick wall which encloses it, limits the prospect. In 1787, an elegant court-

house was erected on the left of the state-house, and on the right a philosophical hall ; which add very considerably to the beauty of the square.

On the south of these edifices stands the public gaol, neatly built of stone. It has a good half story, and two stories above it, and every apartment is arched with stone against fire. It is a hollow square, a hundred feet in front, and is the most handsome and secure building of the kind in America. To the prison is annexed a work-house, with yards to separate the sexes, and criminals from debtors.

The hospital and poor-house, in which are upwards of three hundred indigent people, (whether we consider the buildings, or the designs for which they were erected) are unrivalled in America. The German church, recently erected, must also rank among the most elegant buildings of this country; and it is said, that Mr. D. Taneberger, a great mechanical genius, has erected a noble organ of more than thirty stops in this church. The principal market, situated between Front and Fourth streets, is a brick edifice, fifteen hundred feet in length ; and with respect to the quantity, variety, and neatness of the commodities there exposed to sale, it is not equalled in America, and probably not exceeded in the world.

The town of Bethlehem, inhabited wholly by Moravians, is pleasantly situated on the north side of Leteigh river, in Pennsylvania, over which a large wooden bridge has been recently erected. It is laid out in regular streets, and consists of about seventy-two dwelling houses, a handsome Moravian church, and an academy for young ladies. There are also three other large buildings, one of which is for single women : it is a spacious edifice,

built with stone, and divided into several large chambers which are all heated with stoves in the winter season, except a large apartment on the first floor which forms the dormitory. Though this room is very high and airy, a ventilator is fixed in the roof, like those commonly used in theatres. In the store-rooms, some work at spinning cotton, wool or hemp, while others are employed in embroidery, and working ruffles, pocket-books, pin-cushions, &c. They dine in the refectory, and each individual puts three shillings and sixpence every week into the common stock, besides which they are obliged to furnish themselves with fire and candle from their respective earnings. They are all under the inspection of a female superintendant, and regularly attend morning and evening prayers in their chapel, which is furnished with an organ and several other instruments of music.

The house for single men stands opposite the main street, and differs but little from that occupied by the single women. Here most of the single tradesmen, journeymen, and apprentices board, under the direction of an elder and warden; and different trades are carried on here, for the common benefit. On the roof of this building is a belvedere, commanding a beautiful and extensive prospect of Delaware river, and the adjacent country.

The house for widows is appropriated for such as have no residence of their own, and they live nearly in the same manner as the single women do. There is also a society of married men, instituted since 1770, for the support of those widows whose husbands have been members of the institution.

The church, where the society attends on Sun-

day; is a simple stone edifice, furnished with an organ, and several religious pictures. In the house adjoining the church is the school for girls, and in 1787 an academy was instituted for young ladies, where they are taught the rudiments of literature, music, needle-work, &c. There is another for boys, which is kept in a house fitted for that purpose, and is under the particular care of the minister of the place. There is also a public tavern at the north end of the town, with genteel accommodations; the profits of which belong to the society.

Annapolis is the capital of Maryland, and the wealthiest town of its size in America. It is situated at the mouth of Severn river, thirty miles south of Baltimore, and the houses are, for the most part, very large and elegant. The design of those who planned the city was to have the whole in form of a circle, with the streets like radii, beginning at the centre where the state-house stands, and thence diverging in every direction: the principal part of the buildings are arranged agreeably to this plan. The state-house is the noblest edifice of the kind in America.

Richmond, the present seat of government in Virginia, stands on the north side of James river, and contains about three hundred houses, part of which are built upon the margin of the river, and the rest upon a hill, which commands an extensive prospect of the circumjacent country. Here a large and elegant state-house has been recently erected; and in the lower part of the town, a handsome bridge, constructed on boats, has been thrown across James river.

Mount Vernon, the celebrated seat of General Washington, is situated on the Virginia bank of

the Potowmac, where it is nearly two miles wide, and about two hundred and eighty miles distant from the sea. The area of the mount is two hundred feet above the surface of the river, and after furnishing a lawn of five acres in front, and about the same in rear of the buildings, it falls off rather abruptly on those two quarters. On the north end it subsides gradually into extensive pasture grounds; while on the south, it slopes more steeply, and terminates with the stables, vineyard, and nurseries. On either wing is a thick grove of flowering forest trees; and parallel with them, on the land side, are two spacious gardens, into which one is led by the serpentine gravel walks, planted with weeping willows, and shady shrubs.

The house itself which is built of wood, but cut and painted to resemble stone, appears venerable and convenient, and the banqueting room, in particular, is very superb. A lofty portico, ninety-six feet in length, and supported by eight pillars, has a charming effect when viewed from the water; and the whole assemblage of the green-house, school-house, offices, and servant's halls, when seen from the land side, has a striking resemblance to a rural village; especially as the lands on that side are laid out somewhat in the form of English gardens, in meadows and grass-grounds, ornamented with little copses, circular clumps, and single trees. A small park on the margin of the river, where the deer are seen through the thickets, alternately with the vessels as they are sailing along, add a romantic appearance to the whole scenery. On the opposite side of a small creek to the northward, a considerable extent of corn fields and pasture land affords a luxurious landscape to the eye; while the blended verdure of woodlands and cul-

View of Mount Yenom on the Potowmuk.





tivated declivities on the Maryland shore, varie-gates the prospect in a most charming manner.

The federal city of Washington, laid out in 1792, and designed for the metropolis of the United States, is seated on a neck of land, near the main branch of the Patowmac. The ground marked out for this city was fourteen miles in circumference; a scale well adapted to the metropolis of a country, whose length is one thousand two hundred miles, and which is nearly a thousand miles in breadth. The streets run east; west, north, and south; but a variety of avenues and squares obviate the monotony that would otherwise ensue from their crossing each other at right angles. The principal streets are about a hundred feet wide, and the hollow squares are designed for the erection of statues, or other national monuments.

The capitol stands in the central and most elevated part of the city, commanding a fine prospect of all the other buildings and of the adjacent country. Here are apartments for the accommodation of Congress, and all the principal public offices, besides the courts of judicature. And on a small eminence to the west of this structure, is an equestrian statue of General Washington.

The president's house, situated upon an eminence, at the distance of a mile and a half from the capitol, is a stone edifice, two stories high; and may be pronounced one of the finest pieces of architecture in America. Between the house and the river are nearly a hundred acres of land laid out in pleasure grounds; and an extensive park runs, in an easterly direction from the Patowmac to the capitol. Here also are some elegant houses for

the accommodation of foreign ambassadors, a large hotel, a marine hospital, churches, theatres, &c.

Newbern, the largest town in North Carolina, stands on a flat sandy point of land, formed by the confluence of the rivers Neus and Trent. It contains about four hundred houses all built of wood, except the palace, the church, the prison, and two or three dwelling-houses, which are of brick. The palace was erected previously to the revolution, for the residence of the governors. It is tolerably spacious and elegant, two stories high, and has two wings for offices, which are connected with the principal building by a circular arcade. This edifice, however, is now much out of repair. One of the halls is used for a dancing room, and another for a school, which are the only present uses of this palace. The episcopal church is a small brick building, with a bell, and is the only place for public worship in the town. The court house is raised on brick arches, so as to render the lower part a convenient market-place; but the principal marketing is transacted with the people in their canoes and boats at the river side.

Charleston, the only considerable town in South Carolina, is situated on the tongue of land which is formed by the confluence of Ashley and Cooper rivers, which mingle their waters immediately below the town, and form a spacious and convenient harbour. The streets, from east to west, extend from river to river, and, running in a straight line, not only open beautiful prospects each way, but also afford excellent opportunities, by means of subterraneous drains, for removing all nuisances. These streets are intersected by others nearly at right angles, and throw the town into a number of squares, with dwelling-houses in front, and offices

and little gardens behind. Some of the buildings are elegant, and most of them are neat, airy, and well finished. The public edifices are an exchange, state-house, armoury, and poor-house ; besides ten churches; one meeting house, and two Jewish synagogues.

- Bennington, the principal town of Vermont, is situated in the south west corner of the state, near the foot of the Green Mountain. Its public buildings are a church for congregationalists, a court-house, and a gaol. It contains a great number of elegant dwelling-houses, and is altogether a very flourishing town.

QUEBEC, the capital of Canada, is built on the bank of St. Lawrence river, on a rock, in two divisions called the Upper and the Lower Town. The Upper Town possesses a surprising strength, being equally fortified by nature and art ; and many of the buildings are tolerably handsome ; but in the Lower Town, the streets are narrow and irregular, and the houses, in general, are unsightly and incommodious.

The governor's house is a plain stone edifice, consisting of two parts, which are separated by a spacious court : the old division is built on an inaccessible part of the rock, and contains most of the public offices, though the apartments are small and ill contrived ; the other is appropriated to the residence of the governor, and is tolerably finished. In the adjoining garden is a parapet wall, on which a few guns are planted, but the château itself is by no means so strong as some travellers have represented it. The other public buildings are a monastery of Franciscan friars, three nunneries, and an old edifice plainly fitted up for the accommodation of the legislative council and as-

sembly of representatives. Here likewise are artillery barracks, capable of containing five hundred men; an armoury, where ten thousand stand of arms are arrayed with the most exquisite neatness; and an engineer's drawing room, containing plans of fortifications, models, &c.

HALIFAX, the capital of Nova Scotia, is situated on Chebucto Bay; and has attained a degree of splendor that bids fair to rival the first cities in America. The streets are regularly laid out, and cross each other at right angles; the whole rising gradually from the water, upon the side of a hill, whose top is regularly fortified. The harbour is perfectly sheltered from all winds at the distance of twelve miles from the sea, and is so spacious, that a thousand vessels may ride in it without the least danger. It is commanded by several batteries of heavy cannon; and there are many commodious wharfs upon it, which have from twelve to eighteen feet water at all tides. There is a small but excellent careening yard for ships of the royal navy; and there is an excellent light-house just off the entrance of the harbour, which is visible either by night or day, at the distance of six leagues.

MISCELLANEOUS CURIOSITIES.

THE Abbé Clavigero informs us, that when the Mexicans were brought under subjection to the Colhuan and Tepanecan nations, and confined to the miserable little islands on the lake of Mexico, they had no land to cultivate, until necessity compelled them to form moveable gardens, which

floated on the waters of the lake. The method which they adopted and still practise in making these floating gardens is extremely simple. They plait and twist together willows, and roots of marsh plants, or other materials, which are light, but capable of supporting the earth firmly united. Upon this foundation they lay the light bushes which float on the lake; and over all, the mud and dirt which is drawn up from the bottom. Their regular figure is quadrangular; their length and breadth various; but in general they are about eight perches long, and three broad, and have somewhat less than twelve inches of elevation above the surface of the water.

These were the first fields which the Mexicans had after the foundation of Mexico, and there they first cultivated maize, pepper, and other plants. In time, as these fields became numerous from the industry of the people, they cultivated gardens of flowers and odoriferous plants, which were employed in the worship of their gods, and for the recreation of their nobles. At present they cultivate flowers and garden herbs upon them. Every morning at sun-rise, innumerable vessels laden with various kinds of flowers and herbs cultivated in those gardens, arrive by the canals at the great market-place of Mexico. All plants thrive in them surprisingly; for the mud of the lake affords a very fertile soil, and requires no rain. In the large gardens there is commonly a tree or a little hut to shelter the cultivator from the oppressive beams of the sun. When the owner of a garden wishes to change his situation, to remove from a disagreeable neighbour, or to come nearer to his own family, he gets into his little vessel, and by his own strength alone, if the garden be small,

he tows it after him, and conducts it wherever he pleases. That part of the lake where these floating gardens are, is a place of high recreation, where the senses receive all possible gratification.

The natural bridge of Virginia is one of the most sublime of Nature's works, and consequently demands a place in a work of this nature. It is on the ascent of a hill, which seems to have been cloven through its length, by some great convulsion. The fissure just at the bridge is, by some admeasurements two hundred and seventy feet deep, but by others only two hundred and five. It is about forty-five feet wide at the bottom, and ninety at the top; which of course determines the length of the bridge, and its elevation from the water. Its breadth in the middle is about sixty feet; but more at the ends, and the thickness of the mass at the summit of the arch is about forty feet. A part of this thickness is constituted by a coat of earth, which gives growth to many large trees; and the residue, with the hill on both sides, is one solid rock of lime-stone. The arch approaches the semi elliptical form, but the larger axis of the ellipses, which would be the cord of the arch, is several times longer than the transverse.

"Though the sides of this bridge," says Mr. Jefferson, "are provided in some parts with a parapet of fixed rocks, yet few persons have resolution to walk over them, and look over into the abyss. You involuntarily fall on your hands and knees, creep to the parapet, and peep over it. Looking down from this height about a minute gave me a violent head-ach. But if the view from the top be painful and intolerable, that from below is delightful in an equal extreme. It is impossible, indeed, for the emotions arising from the

sublime to be felt beyond what they are here : so beautiful an arch, so elevated, so light, and springing as it were up to heaven, the rapture of the spectator is really indescribable ! - The fissure continuing narrow, deep, and straight for a considerable distance above and below the bridge, opens a short but very pleasing view of the North Mountain on one side, and Blue Ridge on the other, at the distance each of them of about five miles. This bridge is in the county of Rock-bridge, to which it has given name, and affords a public and commodious passage over a valley, which cannot be crossed elsewhere for a considerable distance. The stream passing under it, called Cedar creek, is a water of James river, and is sufficient in the driest seasons to turn a grist-mill, though its fountain is not more than two miles above."

The banks, or rather precipices, of Kentucky and Dick's rivers are to be reckoned among the natural curiosities of America. Here the astonished eye beholds three or four hundred feet of solid perpendicular rock, in some parts of the lime-stone kind, and in others of fine white marble, curiously chequered with strata of astonishing regularity. These rivers have the appearance of deep artificial canals ; their banks are level, and covered with red-cedar groves.

CUSTOMS, MANNERS, RELIGION, AND GOVERNMENT OF THE INHABITANTS OF NORTH AMERICA.

MEXICO, with which we shall begin, is inhabited by a mixed people, consisting of Spaniards, Negroes, native Indians, Creoles, Mestizos, and various other mixtures. The whites are either born in Spain, or Creoles: the native Spaniards mostly enjoy places of honour and profit, and are concerned in trade. These resemble the Spaniards of Europe, and have the same gravity of behaviour, the same natural sagacity, but a still greater share of pride and stateliness; for they here consider their being born in Spain as a singular honour, and are therefore, in return, looked upon by the Creoles with envy and hatred. The latter, indeed, are destitute of that firmness and patience which distinguish the native Spaniards. They are weak, effeminate, and destitute of courage; for, living in an enervating heat, and spending their time in loitering and inactive pleasures, they have nothing bold and manly to enable them to make a figure in active life; and few have any taste for the satisfaction of a learned retirement. They are luxurious without elegance, fond of show and parade, temperate in eating and drinking, and employ themselves principally in amours and intrigues. The ladies are said to be little celebrated for their chastity or domestic virtues, but exert all their genius and abilities in combating the restraints that are laid upon them.

All the public employments in Mexico are held by native Spaniards; but they hold them only for a limited time, which must not exceed

three years. Jealousy and avarice have an influence on all public regulations; and every officer, from the highest to the lowest, is said to have the avidity, which a new and lucrative post of short duration inspires. There are some troops kept in Mexico, and a good revenue appropriated for their maintenance, and the support of their fortifications; but the latter are neglected, and the soldiers are ill clothed, ill paid, and worse disciplined.

This is the character given of the Spaniards of Mexico by authors of reputation; but it is probable there are many exceptions; and, indeed, it is not unlikely, that the ill behaviour of the majority may have caused these general reflections upon all.

With respect to the original Mexicans, they, like the other Americans, are generally tall, well proportioned, active, nimble, and remarkably swift of foot. Their complexion is a deep olive; their eyes large, lively, and sparkling; the face round, and usually with agreeable features. Some of them wear their hair flowing loose, others cut short, and others twisted and plaited on the head. Indeed, some nations, within the limits of this vast country, differ greatly in their manners and general appearance: a few deem flat noses the greatest ornament, and therefore purposely flatten those of their infants. Many of them disfigure themselves with paint, representing on their bodies the awkward figures of various birds and beasts; or, in time of war, paint their faces red, to give them a warlike appearance; they likewise anoint their bodies with oil, or fat, to render their joints supple and pliant, and prevent their being bit by musquitos. The people are, however, in gene-

ral clothed, though in a different manner from the Spaniards. They wear pendants, bracelets, and necklaces. The men have a thin plate of gold or silver, of an oval figure, and in the form of a crescent, hanging over their upper lip. The women, instead of this plate, wear a ring, which goes through the bridle of the nose. These they have of various sizes, but lay aside the larger sort at their entertainments; and the smaller do not hinder their eating. Their great men wear two gold plates, of the shape of a heart, a span long at each ear, fastened to it by a gold ring, which stretches the ear to an immoderate size. They likewise wear a kind of coronet or bandage of gold or silver, about the head, eight or ten inches broad, and indented on the upper side; while others have only a bandage of cane, painted red, and stuck round with beautiful feathers standing upright; besides, most of the Indians of both sexes have strings of shells, beads, and other toys, hanging from the neck down to the breast. Those Indians who reside in the Spanish towns, wear a short waistcoat, wide breeches, and a short cloak, resembling the Spanish dress; but their legs are bare, and only a few of them cover their feet with sandals. The women have a short jacket of linen or cotton, over which flows a loose robe. But there are such varieties in dress, depending upon custom and fancy, that it would be endless to enter upon the particulars.

The Mexicans seem to be greatly degenerated, since they were conquered by the Spaniards, both in their genius, temper, and manners. They were once ingenious, hospitable, and generous, except in the article of human sacrifices; but now those who live among the Spaniards are said to

be stupid, cowardly, and treacherous. The buildings, images, paintings, carvings, cotton cloths, manufactured feathers formed into beautiful pictures, and several other pieces of art, show the genius of the ancient Mexicans; and the loss of these is an incontrovertible proof of the decline of that genius. But to what purpose should an Indian labour to improve talents that could only serve to render his bondage more irksome?

Those Indians who have preserved their freedom in the mountains and some other parts of the country, are still a brave, generous, and humane people, unacquainted with the sordid vices and corrupt manners of the inhabitants of the Spanish towns. They spend their time in hunting, fishing, and field exercises; cultivate but little soil, sow and plant what is just sufficient to answer the purposes of nature, and allow nothing for the gratification of appetites founded on luxury. The business of planting is performed by the women, after the men have cleared the ground. The females also execute all domestic offices; spin, weave, and make cotton and linen cloth for their own or their husbands apparel; and are represented as being obedient and respectful to their husbands, who return a mutual affection.

These free Indians dwell in thatched huts, and observe little regularity in their towns; their houses neither standing contiguous nor in the least order, but are dispersed here and there; only they have one common fort or guard house, seated on an eminence, where they hold their councils, and to which they resort on the approach of an enemy. They set up small posts, seven or eight feet high, and two or three asunder, closing up the intervals with clay. The roof resembles that of a barn,

covered with palmetto leaves. The building is about twenty-four feet in length, and twelve in breadth: the hearth is in the middle, and they have only a hole over it, to let out the smoke: as they have no partitions, the whole house forms but one room. Instead of beds they use hammocks, which are hung from the principal beam; and their only seats and tables are blocks of wood. Their other furniture consists of earthen vessels, with large calabashes to hold their liquor; and their arms, as lances, darts, bows, arrows, and quivers, which together with their tools, are hung as ornaments round the room. Their guard house is about a hundred and thirty feet long, and twenty-five broad. The walls are nine or ten feet high, and the ridge of the roof about twenty feet in height, and thatched with palmetto leaves. On the sides are narrow loop-holes, from whence they can repulse an enemy with their arrows; and the ground is, for a good space round, cleared of woods and shrubs, that an enemy may find no shelter or place of concealment. They are defended by strong doors; but the Spaniards easily burn these structures, by shooting flaming arrows into the palmetto leaves which serve for thatch.

Their principal food is either Indian corn parched, ground into flour, and made into thin cakes, or fruit, roots, deer, wild hogs, &c. and sometimes fish. They frequently hunt in companies, a week or a fortnight together, every man carrying with him a hatchet, a bow and arrows, and a long knife, with a dog to beat for game. Some women likewise go with them, to carry their provisions of roasted plantains, parched Indian corn, potatoes, yams, and a few utensils. They lodge at night wherever they happen to be at sun-

set, contriving to be at that time near some river. They hang their hammocks between the trees, and have scarcely any other covering but some plantain leaves, and the next morning, at sunrising begin their hunting. Their game, which chiefly consists of a sort of small wild hogs, are slow of foot, and usually go in droves of two or three hundred ; but they do not always find them, and sometimes hunt a whole day without success. When the beast is wounded or tired with the pursuit, he will stand at bay with the dogs, till the master comes up and shoots him ; he then disembowels the animal, and carries him to a place where the women are appointed to wait. They cut off its head, and skin and quarter it ; what they intend to preserve, they barbecue, by laying it upon a wooden grate, under which is a fire of wood coals, which is kept up till the meat is well dried ; and these pieces will keep a long time. When they have much game, the men assist the women in carrying it home ; and when their stock of provisions is almost spent, they go out again in search for more.

Whether their animal food be fresh killed or dried, they cut it into small pieces, and, putting them into a kind of pipkin, add green plantains or other fruit, and some roots, with a great deal of pepper, stewing them seven or eight hours together in water, without suffering them to boil, which reduces the whole into a kind of pulp ; then, pouring it into an earthen dish or calabash, they set it on a wooden block, and eat, sitting round it on lesser blocks, each having a calabash, of water by his side to cool their fingers while they are eating. They have seldom more than one set meal in a day, but eat plantains and other fruits,

either raw or roasted, almost all day long. They have a great variety of liquors, but their ordinary beverage is water, with the flour of Indian corn infused in it, and drank off immediately. Their other liquors are made of different fruits, particularly plantains and pine apples; and to their juice, mixed with water, they sometimes add honey.

Their principal employments being hunting, shooting, and fishing, every man brings up his son to them, and they are said to be so expert, when children, that a boy of eight or ten years of age will split a cane set up at twenty yards distance, with an arrow discharged from his bow, and kill a bird flying. But the most expert of the Mexicans are the Mosqueto Indians, who live in the province of Honduras. These are tall, well-made, strong, and nimble, long-visaged, and have a stern look, and black lank hair. They inhabit the sea-shore and the banks of rivers, and are so expert as to turn aside any missive weapons thrown at them, with a small cane no bigger than a gun-stick. Their principal employment is striking fish, particularly the manatee and turtle; whence the English privateers, when they cruise on the Mexican coast, have usually one or two of these Mosqueto Indians on board, to strike fish; and they will take enough to maintain a ship's crew of a hundred men. When they serve the English, they learn the use of the gun, and soon become excellent marksmen; they behave with great bravery in an engagement, and never give back while supported by the party that entertains them.

We shall now proceed to the Indians of Florida, who are also of an olive complexion, and

have robust bodies, finely proportioned ; but both sexes have no other clothes but a deer skin fastened round their waist. They stain their skins with the juice of plants, and have long black hair, which they twist and bind upon the head, so as to render it very becoming. The women, who are well-shaped and handsome, are so active as to climb, with surprising swiftness, to the tops of the highest trees, and swim across broad rivers, with their children on their backs. The men make use of bows and arrows, which they manage with great dexterity ; the strings of their bows are made of the sinews of stags, and their arrows pointed with sharp stones, or the teeth of fishes.

Their management, with respect to their corn, which is accounted the common stock of the public, is particularly worthy of notice. The crop, which is calculated to serve only half the year, is collected into granaries appointed for that purpose ; and afterwards distributed to every family, in proportion to the number of persons it contains. The soil is, indeed, capable of producing much more corn than they are able to consume, but they chuse to sow no more than will serve them six months, retiring for the rest of the year, into the deep recesses of the forests, where they build huts of palm-trees, and live upon roots, wild fowl, and fish. They are also fond of the flesh of alligators, the young of which are said to be delicious eating, but have a strong musky smell. They dress their meat, in the smoke, upon a wooden gridiron, and their common drink is water. With respect to their religion, they worship the Sun and Moon, and have an extreme aversion to all Christians ; which is the less to be wondered

at, as the horrid cruelties exercised by the Spaniards on the natives of the adjacent island of Cuba and other places, could not fail of exciting their abhorrence. The people are, in general, satisfied with one wife; but the chiefs are indulged with more, though the children of only one of them succeed to the father's dignity.

The government of the Floridans is in the hands of many chiefs, who are called cassiques, and are generally at war with each other; but this is far from being carried on in an open manner; on the contrary they usually make use of surprise or stratagem, exercising great cruelty upon the men they take prisoners, but sparing the women and children, whom they carry off, and settle among them. On their obtaining a victory, they, at their return home, assemble all their friends, and feast three days and nights, spending their time in singing and dancing.

Among the various Indian nations and tribes within the vast extent of the country on the back of the English settlements, those termed the Five Nations, deserve particular notice, as being dreaded and revered by all the others, for their superior understanding, activity, and valour in war, in which constant practice has rendered them expert, they being generally at war with one nation or other, and sometimes with several at a time. Their manners, customs, and modes of dress, are, as nearly as possible, adopted by many of the other tribes; and those Indians are generally esteemed by the other nations the politest and best bred, who the nearest resemble them. They claim the whole of the country that lies to the south of the river St. Lawrence, as far as the Ohio, and down that river to the Wabash, from

the mouth of the Wabach to the bounds of Virginia: on the westward they formerly extended to the lakes of Ontario and Erie; and their eastern boundaries were the lake Champlain and the British colonies. When the English first settled in America, they were able to raise fifteen thousand fighting men; but at present their numbers are greatly reduced.

The Mohocks were once the most numerous tribe among them, though they are now the smallest; they however still preserve a superiority over the rest, and are consulted and appealed to, in great emergencies, by all the others. About a hundred years ago, they destroyed the greatest part of the Hurons, who then lived on the south side of the lake Ontario, and the remainder now live, by permission of the Five Nations, at the west end of lake Erie. They subdued several other nations, and obliged some to change their habitations, while others, as a badge of subjection, are not allowed to appear painted at any general meeting or congress, where the Five Nations attend. They have been inveterate enemies to the French, from the time of their first settling in Canada, till its being conquered by the English; and are almost the only Indians, within many hundred miles, that have been proof against their solicitations to turn against us.

These people are far from being deficient in good sense and ingenuity: they have strong imaginations, and their memories are so retentive, that, when they have been once at a place, let it be ever so distant or obscure, they will readily find it again: even in dark cloudy weather, they direct their course with great exactness, by ob-

serving the bark and boughs of trees; the north side in Canada being always mossy, and the boughs on the other side the largest. They are grave in deportment upon serious occasions; observant of those in company; respectful to the old; and of a cool and deliberate temper, by which they are never in haste to speak before they have thoroughly considered the matter, and are sure the person who spoke before them has finished all he had to say. They have therefore the greatest contempt for the Europeans, who interrupt each other, and frequently speak altogether. Nothing is more edifying than their behaviour in their public councils and assemblies. Every man there is heard in his turn, according as his years, his wisdom, or his services to his country, have ranked him. Not a word, not a whisper, nor a murmur, is heard from the rest, while he speaks; no indecent commendations, no ill-timed applause. The younger class attend for their instruction. Here they learn the history of their nation; here they are inflamed with the songs of those who celebrate the warlike actions of their ancestors; and here they are made acquainted with the interests of their country, and the proper mode of pursuing them.

There is no people amongst whom the laws of hospitality are more sacred, or executed with more generosity and good-will. Their houses, their provisions, even their young women, are not enough to oblige a guest. To those of their own nation they are likewise very humane and beneficent. If any one of them succeed ill in his hunting, or has his house burnt, he feels no other effect of his misfortune, than that it gives him an opportunity of experiencing the benevolence and regard of his fellow-citizens, who for that

purpose have all things almost in common. But to the enemies of his country, or to those who have privately offended him, the American is implacable. He never, indeed, makes use of curses or indecent expressions ; but conceals his sentiments, and appears reconciled, till by some treachery or surprise he has an opportunity of executing an horrible revenge. No length of time is sufficient to allay his resentment ; no distance of place great enough to protect the object ; he crosses the steepest mountains, pierces the most impracticable forests, and traverses the most hideous bogs and deserts for several hundreds of miles, bearing the inclemency of the seasons, the fatigue of the expedition, the extremes of hunger and thirst, with patience and cheerfulness, in hopes of surprising his enemy on whom he exercises the most shocking barbarities. To such extremes do the Indians push their friendship or their enmity ; and such, in general indeed, is the character of all strong and uncultivated minds. The Indians, however, esteem nothing so unworthy of a man of sense as a peevish temper, and a proneness to sudden anger ; which has such an effect, that quarrels seldom happen among them, when they are not intoxicated with liquor. Yet they are extremely sensible of the pleasures of friendship ; for each of them, at a certain age, makes choice of one nearly of the same standing in life, to be his most intimate and bosom friend ; these two enter into mutual engagements, by which they oblige themselves to brave any danger, and run any risque, to assist and support each other. This attachment is carried to such a length, as to conquer the fear of death, which they consider only as a temporary separation ; for they are persuaded

that they shall meet and be reunited in friendship in the other world, where they shall need each others assistance, as well as here.

All the Indian nations appear to have some sense of a Deity, and a kind of religion; but this is so various, perplexed and confused, that it is difficult to give an account of it. Their ideas of the nature and attributes of God are very obscure, and absurd; but they all acknowledge him to be the Creator of the world; and seem to have some idea that there are spirits of a higher and more excellent nature than man, and, supposing them every where present, they frequently invoke them, and express a wish to act agreeably to their desires. They likewise imagine that there is an evil spirit, who is always inclined to mischief; and as they are persuaded that he has great power, he is a principal object of their devotions; for they generally address him most heartily; beseeching him to do them no harm: but, supposing the other to be propitious, and always inclined to do them good, they intreat him to bestow blessings upon them, and prevent the evil spirit from hurting them. In order to procure the protection of the good spirit, they imagine it necessary to distinguish themselves by becoming exact marksmen, expert hunters, and good warriors.

They have great dependence on their dreams, believing that, from the dreams of youth, may be collected the history of their future life: hence, when they arrive at a certain age, dreaming is made a kind of religious ceremony, which is thus performed: they besmear their faces all over with black paint, and fast for several days, in which time they expect the propitious spirit will appear

to them, in some form or other, while they sleep. Their priests frequently persuade the people, that they have revelations of future events, and are authorised to command them to pursue such and such measures; they likewise interpret all the people's dreams, and unfold the mysteries of religion. The other world they represent as a place abounding with an inexhaustible plenty of every thing desirable, where they shall enjoy the full gratification of all their senses. This is, doubtless, the motive that induces the Indians to meet death with the utmost indifference and composure; none of them being in the least dismayed at the news that they have but a few hours or minutes to live.

Polygamy is practised by some nations, but in most they are contented with one wife; and it is said that no nation of the North-American Indians is without a regular marriage, in which are many ceremonies, the principal of which is said to be the bride's presenting the bridegroom a plate of corn. Though the women are incontinent while single, they are remarkably chaste after marriage. The punishment both of the adulterer and the adulteress is in the hands of the husband himself, and is often severe, from its being inflicted by one who is both the injured party and the judge. Their marriages are not very fruitful, but their children are brought forth with little pain, and the mothers suffer but little diminution of their usual strength. They are so fond of their children, that they seldom wean them till they are upwards of two years old, and carry them on their backs, till the burthen becomes quite insupportable. As soon as they can walk, they go when and where they please; but their parents instruct

them very early in the use of arms, and frequently relate to them the great achievements of their ancestors, in order to inspire them with bravery. They introduce them very early into the public councils, and make them acquainted with the most important affairs and transactions : this accustoms them to secrecy, gives them a composed and manly air, inspires them with emulation, and makes them bold and enterprising. They seldom chastise their children, for, when they are young, they say they are not sufficiently endowed with reason, for, if they were, they would not do wrong : when they are more advanced in life, they do not then chastise them, because, being capable of judging they ought to be masters of their own actions, and not to be accountable to any one. In the same manner, they excuse any ill treatment they receive from a person in a state of inebriety : " Should we blame or punish him," say they, " when, being void of reason, he knows not what he does?"

The men are remarkable for their indolence, on which they seem to pride themselves, pretending that labour would degrade them, as belonging solely to the women, while they are formed only for war, hunting, and fishing. However, they make their arms and fishing-lines, form their canoes, and build and repair their houses ; though they frequently oblige the women to assist them, even in those employments, besides their attending all domestic affairs.

Liberty, in its fullest extent, is their darling privilege, it being the great and fundamental principle of their policy, that every man is equally free and independent, and that nothing can be a compensation for the loss of liberty. Avarice is utterly

unknown among them, and they are neither prompted by ambition, nor actuated by a love of gold ; for the distinctions of rich and poor, high and low, do not so far take place among them, as to create the least uneasiness, or excite the resentment of any individual ; hence the brave and deserving, in whatever circumstances, are sure to be esteemed. Their feasts, whether at a triumph, a visit, or a funeral, are very simple. Each guest however is sure to be treated kindly, and is neither the subject of ridicule, while present ; nor of cruel remarks, when absent. On these occasions, a servile regard is never paid to the distinctions of rich and poor, so as to lessen the spirit and pleasure of conversation, when the company happens to be formed of a mixture of both. When any business of consequence is transacted, they appoint a feast upon the occasion, of which almost the whole nation partakes : but upon matters of less general concern, are lesser feasts, to which none are invited, but those engaged in that particular business. Before the entertainment is ready, the principal person begins a song, on the remarkable events of their history, and whatever may tend to their honour or instruction. The others sing in their turn. They have also dances, chiefly of a martial kind ; and no business or solemnity is carried on, without songs and dances.

The general in chief, who may be considered as their king, is usually chosen by the elders or heads of tribes ; and his election is also attended with singing and dancing ; but he is rather revered as a father than feared as a monarch ; for he has no guards, no officers of justice, and no prisons. The other forms of government may be considered as a kind of aristocracies, in which

no other qualification is absolutely necessary for their chiefs, but age, with experience and ability in their affairs. However, there are generally in every tribe, some particular families, from whence they chuse their chiefs, unless they are deemed unworthy of that rank ; indeed, there are some of the tribes themselves, who, on account of their number or bravery, have a pre-eminence over the rest, which, not being exacted with pride, is never disputed, where due.

The great council is composed of the heads of families, and such whose capacity has raised them to the same degree of consideration. These meet in a house built in each of their towns, where they receive ambassadors, deliver them an answer, sing their traditional war songs, and commemorate the virtues of their deceased relatives. Here they likewise propose all such affairs as relate to the state, which have been already digested in the secret councils, where none but the head men assist. The chiefs seldom speak much themselves at these general meetings, which are always public ; but entrust their sentiments with a person called their speaker or orator, there being one of this profession in every tribe and town. Their manner of speaking is natural and easy, their words strong and expressive, their style bold, figurative, and laconic, nothing being said but what is necessary either to inform the judgment, or excite such passions as the subject naturally requires.

The same council has likewise the charge of the peace and order of the community. Their suits are few, and soon decided ; for they have neither property nor art sufficient to render them perplexed and tedious. When criminal affairs are

so flagrant as to become a national concern, they are brought before the same jurisdiction: but, in ordinary cases, the crime is either revenged or compromised by the parties concerned. If a murderer be committed, the family that has lost a relation prepares to kill the murderer, which is no sooner done, than the kindred of the last person slain think themselves as much injured, and as justifiable in taking revenge, as if the violence had not began among themselves. But things are in general determined in a more amicable manner: the offender absents himself, and his friends send a compliment of condolence to those of the party murdered, offering them presents, which are seldom refused. Upon this occasion, the head of the family delivers the presents in a formal speech, one by one, sometimes to the number of sixty articles; saying, "By this I remove the hatchet from the wound. By this I dry up the flowing blood." And thus in a figurative manner they take away, one by one, all the circumstances and consequences of the murder. If the murder be committed by one of the same cabin, that cabin has the full right of judgment within itself, without appeal, either to kill the guilty person, to pardon him, or to force him to give some recompence to the wife or children of the slain. Meanwhile the supreme authority of the nation looks on unconcerned.

As these people are of a vindictive disposition, they frequently take up arms on very trifling provocations. Their private quarrels are frequently decided this way, and expeditions undertaken without the knowledge or consent of a general council. These private expeditions are not only winked at, but excused as a means of keeping their young

men in action, and inuring them to warlike exercises. But, when war becomes a national affair, it is entered upon with great deliberation. An assembly of the sachems and chief warriors is first called to deliberate upon the affair. In this general congress among the northern Indians and the Five Nations, the women have a voice as well as the men. When they are assembled, the chief sachem or president, taking up the tomahawk, which lies by him, says, "Who among you will go and fight against such a nation? Who among you will bring captives from thence, to supply the place of our deceased friends, that our wrongs may be revenged, and our name and honour be maintained as long as the rivers flow, grass grows, or the sun and moon shall endure?" Then one of the principal warriors rising harangues the whole assembly, and, at length addressing himself to the young men, asks who among them will go with him to fight their enemies? On which they generally rise, one after another, and fall in behind him, while he walks round the circle, till he is joined by a sufficient number. On these occasions they have usually a deer, or some other beast, roasted whole; and, after the entertainment, the dance begins, and a war song is sung, having a relation to their intended expedition and conquest, or to their courage, their dexterity in fighting, and the manner in which they will vanquish their enemies.—Such songs are always uttered in strong and pathetic expressions, with a tone that inspires terror.

Their women have such influence in these consultations, that the issue depends much upon them: for, if any one of them, in conjunction with the chiefs, be disposed to excite one who does

not immediately depend upon them to join in the war, she presents him, by the hands of some trusty young warrior, a string of wampum, which seldom fails of producing the effect: but, when they solicit an offensive or defensive alliance with a whole nation, they send an embassy with a large belt of wampum and a bloody hatchet, inviting them to come and drink the blood of their enemies.

Previously to their acquaintance with the Europeans, the wampum, used upon these occasions, was formed only of small shells picked up on the sea-coasts, and the banks of the lakes. But it now consists of cylindrical beads, made of black and white shells, which are esteemed, among them, as much as silver and gold among us. The black they think the most valuable, but both of them are considered as great riches and ornaments. They have the art of stringing, twisting, and interweaving them in their belts, collars, blankets, &c. in ten thousand different forms and figures, so as not only to be ornaments for every part of dress, but expressive of all their important transactions. They dye the wampum of various colours; and as they are made significant of almost every thing they please, by these their records are kept, and their thoughts communicated to one another, in some degree as ours are by writing. Thus the belts that pass from one nation to another, in all important transactions, are carefully preserved in the cabins of the chiefs, and serve, both as a public treasure, and a kind of record or history.

Each nation or tribe has its distinct ensign or coat of arms, which generally consists of some animal. Thus the Five Nations have the bear, wolf, otter, eagle, and tortoise: the tribes are ge-

nerally distinguished by these names, and rude sketches of those animals are pricked and painted on several parts of their bodies. When they march through the woods, they generally, at every encampment, cut the figure of their arms on trees, especially when they have had a successful campaign, that travellers may know they have been there.

Their military appearance is terrible. They cut off all their hair, except a spot on the crown of the head, and pluck off the eye-brows. The lock left upon the head is divided into several parts, each of which is stiffened and intermixed with beads and feathers of various shapes and colours; the whole twisted and connected together, upon the top of the head; which is painted red down to the eye-brows, and sprinkled over with white down. The gristles of their ears are slit almost round, and hung with ornaments that have generally the figure of some bird or beast drawn upon them. Their noses are likewise bored and hung with beads, and their faces painted with various colours. On their breast, they wear a gorget of brass, or some other metal; and by a string, which hangs down from the neck, is suspended the scalping knife. Thus equipped they march forth, singing their war songs, till they lose sight of their village; and are generally followed by the women, who assist them in carrying their baggage, but usually return before they proceed to an engagement.

They have commonly one commander for every ten men, and, if the number amount to a hundred, a general is appointed, not strictly to command, but to give his opinion. They have no stated rules of discipline, nor fixed methods of carrying on

a war; but make their attacks in as many different ways as there are occasions, but generally in flying parties, equipped for that purpose with a thin light dress, usually consisting of nothing more than a shirt.

The weapons in use among those who trade with the English, are commonly a firelock, hatchet, and scalping knife; but the others use tomahawks, bows, and pikes.

The tomahawk is an ancient weapon used by them in war, before they knew the use of iron and steel; since which hatchets have been substituted in their room; but it still retains its use and importance, and, like the calumet or pipe of peace, is frequently very significant. This instrument has a long handle, and towards the other end is a round knob of solid wood, calculated to knock a man down; on the side is a point bending a little towards the handle, and from the knob projects another point of a considerable length, to thrust with like a spear.

Every morning the commander harangues his detachment, giving his advice for the conduct of affairs during the day. If on any occasion he would detach a party, he proposes the affair, and gives his opinion how and by what number, it should be performed; and it seldom happens that he is opposed in any of his measures; for the qualifications necessary to recommend a person to the chief command, are his being fortunate, brave, and disinterested; and they cheerfully obey one whom they believe possessed of all these qualifications.

The Indians, on returning from a successful campaign, manage their march so as to approach their village towards the evening, and then send two or three to acquaint their chief and the whole

village with the most material circumstances of the campaign. The next morning, as soon as it is light, they give their prisoners new clothes, adorn their heads with feathers, paint their faces with various colours, and put into their hands a white staff, tasselled round with the tails of deer. The war captain then giving as many yells, as he has taken scalps and prisoners, the whole village assemble at the water side. As soon as the warriors appear, four or five young men get into a canoe, if they come by water, or otherwise march by land. The two first, carrying each a calumet, go singing to search the prisoners, whom they lead in triumph to the cabin, where they are to receive their doom. The owner of this cabin has the power of determining their fate, though it is frequently left to some woman, who has lost her husband, son, or brother, in the war; and when this is the case, she usually adopts him in the place of the deceased. The prisoner has victuals immediately given him, and, while he is at this repast, a consultation is held; and, if it be resolved to save his life, two young men untie him, and taking him by the hands, lead him to the cabin of the person into whose family he is to be adopted, where he is received with all imaginable marks of kindness. He is treated as a friend, a husband, or a brother; and they soon love him with the same tenderness as if he stood in one of those relations to them. But if he be doomed to die, these people, who, in other respects, behave with the utmost humanity, show that they are truly savages; for sentence is no sooner passed, than the whole village set up the death cry; and the execution of him, whom they had hesitated, whether he should not have a tender relation to them, is no longer deferred than they can make necessary.

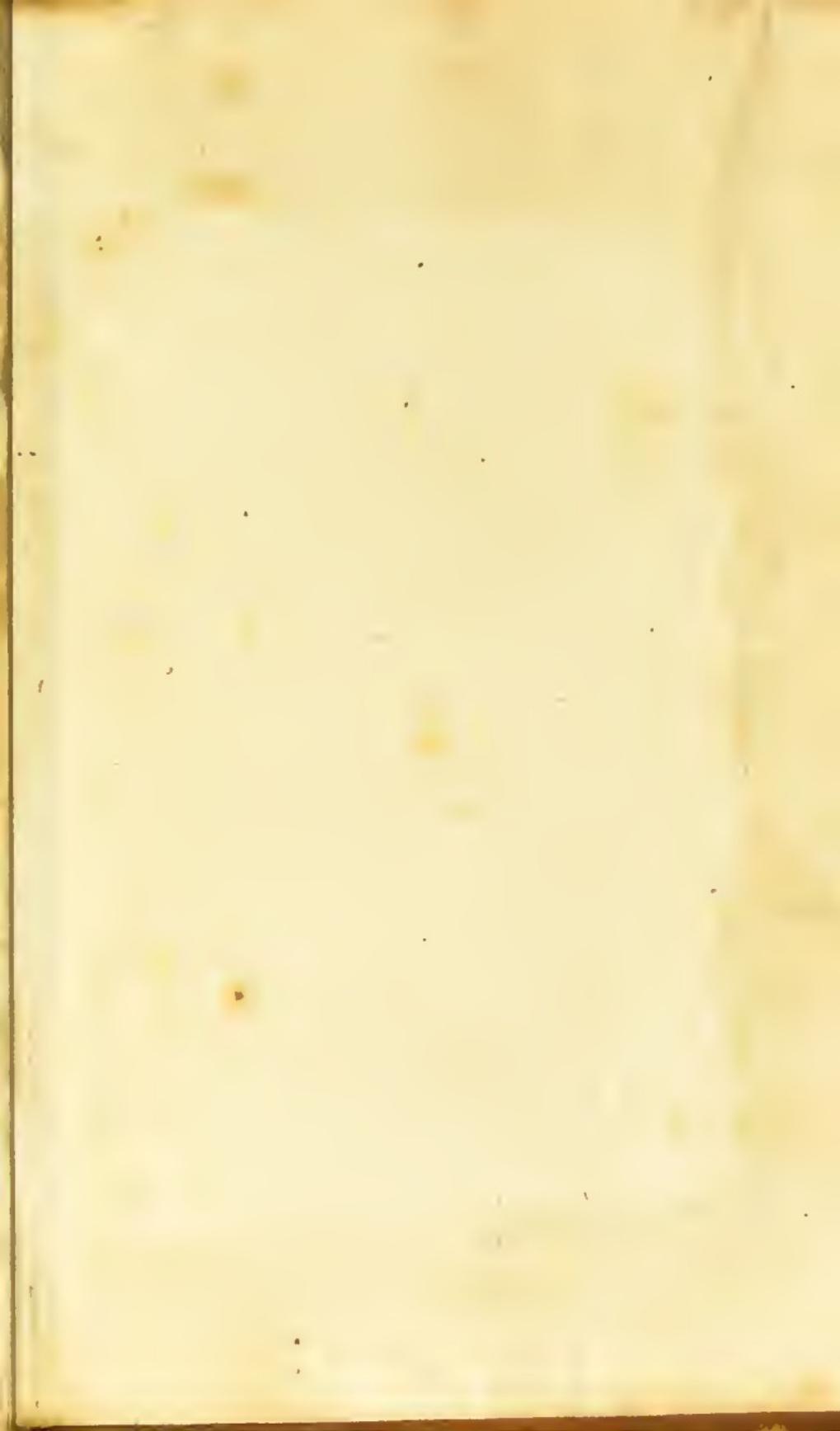
preparations for treating him with the most dreadful cruelty. They first strip him, and, fixing two posts in the ground, fasten two pieces of wood from one to the other; one about two feet from the ground, and the other about five or six feet higher: then obliging the unhappy victim to stand upon the lower cross-piece, they tie his legs to it, a little asunder; while his hands are extended and tied to the angles formed by the upper piece. In this posture they burn him all over the body, first daubing him with pitch. The whole village, men, women, and children, assemble around him, every one torturing him in what manner they please, each striving to exceed the other in cruelty; but, if none of them are inclined to lengthen out his torments, he is either shot to death with arrows, or enclosed with dry bark, to which they set fire. They then leave him on the frame, and in the evening run from cabin to cabin, superstitiously striking, with small twigs, the walls, furniture, and roofs, to prevent his spirit remaining there, to revenge their cruelties. The remainder of the day, and the night following, are spent in rejoicing and festivity.

This is the most usual method of murdering their prisoners; but sometimes they fasten them to a single stake, and make a fire round them; at others they scald them to death, and at others cruelly mangle their limbs, tear their flesh, and cut off their fingers and toes, joint by joint. What appears most extraordinary, is, that, if the sufferer be an Indian, there seems, during the whole time of his execution, a contest which shall exceed, they in inflicting the most horrid pains, or he in despising them: not a groan, not a sigh, not a single distortion of countenance escapes him, in the midst of

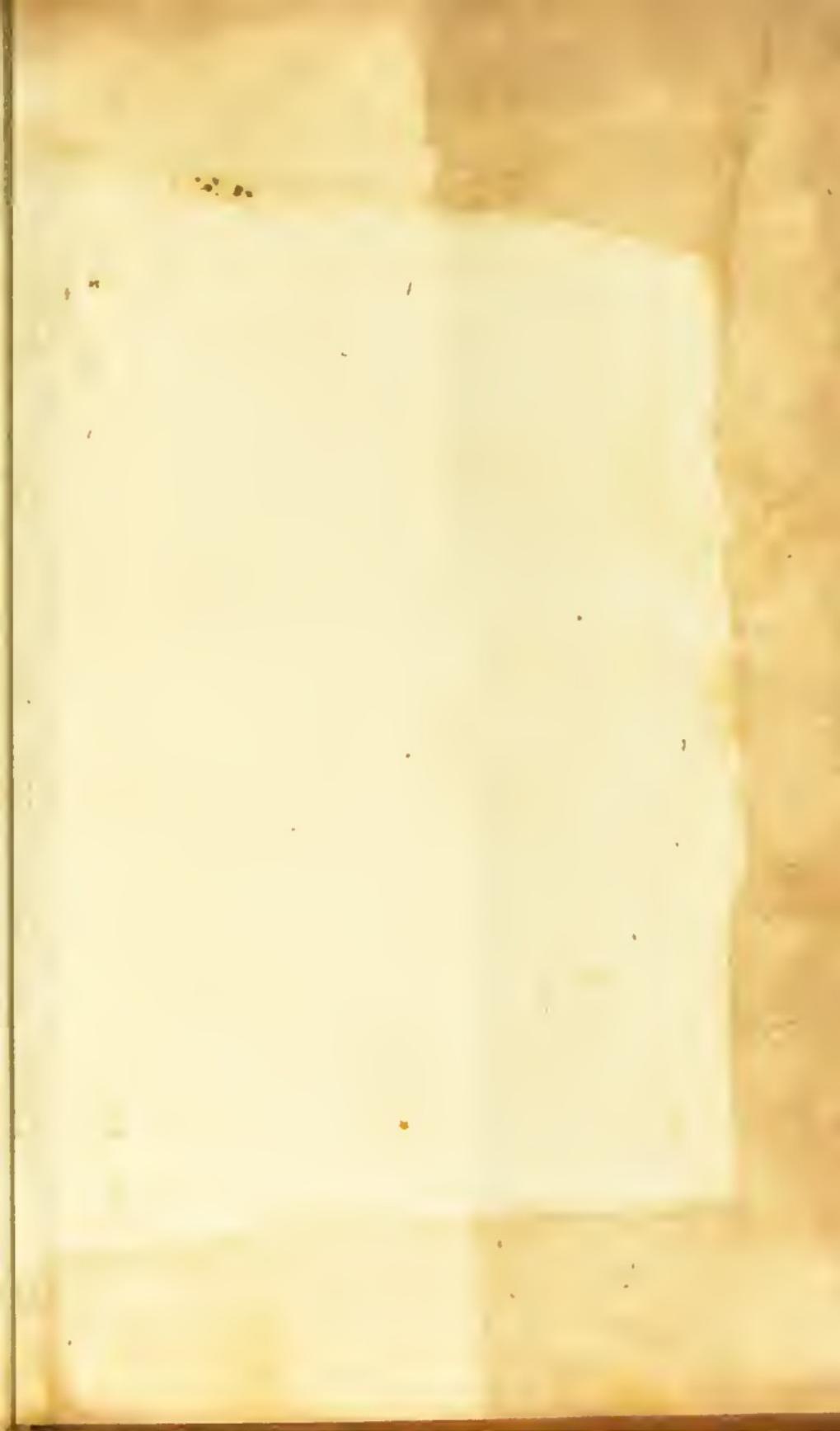
his torments: It is even said, that he recounts his own exploits, tells them the cruelties he has inflicted upon their countrymen, and threatens them with the revenge that will attend his death; that Leevn reproaches them for their ignorance in the art of tormenting; points out methods of more exquisite torture, and more sensible parts of his body to be afflicted. However, they frequently kill their prisoners on the spot, where they have taken them, or in their way home, if they have any fear of their escape, or find it inconvenient to carry them farther. These instances may serve to show the inconsistencies, to which human nature is liable, and the benefit these people would receive from believing that Divine revelation, which breathes an uniform humanity, and the forgiveness of our enemies: for, had they those dispositions, and were they taught to treat their enemies in the manner our holy religion inspires, how consistent, how amiable would be their character.

The scalps of their enemies are considered as the greatest trophies of their bravery, and these they hang up in their houses, they being esteemed according to their number. They have solemn days appointed, when the young men gain a new name or title of honour from their chiefs; and these titles are given according to the qualities of the person, and his performances, of which these scalps are the evidence. This is all the reward they receive for the dangers and fatigues of war; and this they deem abundantly sufficient:

END OF VOL. IX.









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